

JOBS LIKE THIS...

PROVE THE VALUE OF THE LUBRICANT THAT SEALS OUT DIRT AND MOISTURE

GOODBYE bearings if that mud ever works its way into them! Put Texaco Marfak into a bearing and here's what happens —

Marfak stays where you put it. It doesn't squeeze out when the load is heavy, doesn't jar out when the going is rough. Marfak bolds together. It clings to the bearing — guards it with a persistent lubricating barrier against dirt and moisture. It protects parts better, longer, with fewer applications.

In wheel bearings, use Texaco Marfak Heavy Duty. Here the secret of long-lasting protection is Marfak Heavy Duty's ability to form a fluid lubricating film inside the bearing while retaining its original consistency at the outer edges — thus sealing itself in, sealing out dirt and moisture.

Best testimonial to Marfak effectiveness is this fact: More than 250 million pounds of Marfak bave been used to date!

Use the Texaco Simplified Lubrication Plan for contractors' equipment. For information, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

GET FULL ENGINE POWER

Your heavy-duty gasoline and high-speed Diesel engines will run more efficiently and deliver more power when lubricated with oil that keeps them clean—Texaco Ursa Oil X**. Made especially for this service, Ursa Oil X** is fully detergent, dispersive, and has high resistance to oxidation. It keeps rings free, assuring better compression and combustion — great power and fuel economy. It protects bearings from corrosion, greatly reduces engine wear and maintenance costs.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Lise whatever TRACTORS you like.

when it comes to buying tractor-scraper rigs, remember tractor-scraper rigs, remember it's the scraper that controls it's the scraper that controls the "payload." And as every the "payload." And as every ference in the performance of various scrapers under varying job conditions. Moreover, a difference of only 5 yards per hour, figured over the ence of only 5 yards per hour, figured over the operating life of a scraper, can easily mean 60,000 operating life of a scraper, can easily mean our own yards of "pay dirt"—gained or lost—at your own

That's why you'll find more and more smart dirtmovers buying their scrapers entirely independent
of the tractor and holding out for job-proved
LaPlant-Choate "Carrimors." Why LPC? Because
operating records on hundreds of jobs prove conclusively that LaPlant-Choate rigs deliver highest
average production at lowest overall cost. For one

thing, they get bigger loads faster and easier in all kinds of materials. They also gain time traveling to and from the fill because they're free of costly dead weight. And when it comes to spreading—man, there isn't a scraper on the market that can match LaPlant-Choate positive forced ejection for cleaning the bowl in a hurry because the apronance of cleaning the bowl in a hurry because the apronance ahead with the load—no chance of jammoves ahe

But that's only part of this interesting profit story.

For complete facts call or write your nearest
LaPlant-Choate dealer today. See him also for deLaPlant-Choate and prompt, efficient service
pendable repair parts and prompt, efficient service
on your present LPC rigs. LaPlant-Choate Manuon your present LPC rigs. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th
Ave., Oakland 3, Calif.

Positive Forced Ejection scrapers

Positive Forced Ejection scrapers

Positive Forced Ejection scrapers

FOR TRACTOR-SCRAPER BUYERS! A. but be sure you get LaPLANT-CHOATE SCRAPERS for best nesutts under the mage Standard Services

are you aware of the BIG DIFFERENCE in SCRAPER PERFORMANCE?

FINE SAND! One of Michigan's leading contractors used a LaPlant-Choate C-108 with an old RD-7 tractor and pusher to move this fine dune sand in building a recreation area along Lake Michigan. Scraper (equipped with oversize tires for extra flotation) got heaping loads in 15 to 20 seconds, traveling only 40 feet—a record few outfits could match in such hard loading material.

BIG ROCKS! Plenty tough going here — with rocks half as big as a desk plus bumpy terrain and close quarters. Yet F. G. Cheney's C-114 scraper did a remarkable job of "horsing in" the heavy clay overburden—rocks and all—on this stripping job for Lincoln Brick Co. Ripper used for breaking up rock overburden appears in the background.

STICKY GUMBO! LaPlant-Choate's high lifting front apron and exclusive method of positive forced ejection paid real dividends to Benbow Construction Co. on this pond building job in Kansas. As Supt. Dick Fields put it, "I've used them all and the LaPlant-Choate scraper has 'em all beat in every way. It moves more dirt at less cost than any scraper I've ever seen."

SANDY LOAM! In leveling this site for a new housing area, Contractor John Fleming loaded and spread a lot of yardage in a hurry, using a LaPlant-Choate C-108 scraper behind an International TD-18. Material consisted of wet sandy loam soil, mixed with tree roots and chunks of concrete from old foundations but the C-108 handled it with ease without the aid of a pusher.







There's plenty of hydraulic muscle in those Gar Wood Hoists...plenty of guts to do a clean, quick dump job, no matter what you're hauling...plenty of dependable power to help you get your job done easier.

Why? They're rugged. All Gar Wood Hoists and Dump Bodies are designed, engineered, and built to do the toughest kinds of jobs.

What do you work with...sand, gravel, rock, coal, construction material? Whatever you carry, there's at least one type of Gar Wood Hoist and Dump

Body to make the job easier, faster, safer...help you make more money-per-job.

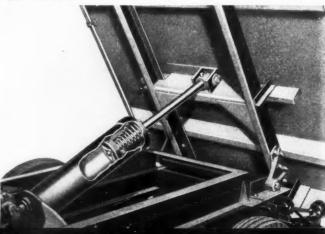
Want proof? Ask the men who use Gar Wood Hoists and Dump Bodies on the toughest jobs all over the world... year in and year out. Ask them for an honest appraisal. See if they don't agree that if it's Gar Wood it's got to be good!

Then, for your own good . . . specify Gar Wood!





HOIST & BODY DIVISION
WAYNE, MICHIGAN



HOISTS . BODIES . WINCHES . CRANES . BOATS . HEATING EQUIPMENT . TANKS . ROAD MACHINERY

the keenest buyers, the biggest users, pick

The fast-growing Jaeger fleet of the Chicago Bridge & Iron Company, one of the biggest users of portable air compressors in the construction field, is typical of the preference for "AIR PLUS" Compressors among companies that know their air costs and buy on comprehensive tests and fleet performance data.

A few of many outstanding Jaeger users among contractors, utilities and industries are: Pennsylvania Railroad • Frederick Snare Corp. Pacific Gas & Electric Co. • Shell Oil Co. • Eastern Asphalt Co. • Cincinnati Street Railway • A. J. Ellis Construction Co. • Gulf Bitulithic Co. • International Harvester Co. • Ford Motor Co. • Loesch & Green Construction Co. • Oliver Iron Mining Co. • A. B. Burton Co. • Clark & Runquist Co. • Northern Pacific Railroad • United Gas Corp. • Bechtel-McCone Corp. • Oklahoma Contracting Co. • Ditmars-Dickman Co, • Signal Pipe Line Co. . M. Hoeffkin Co. . Southern California Edison Co.



Back of every Jaeger Compressor is the most complete service in the construction field — tools, engines, compressors — sold, and serviced in 128 cities of the U.S. and Canada. Ask for Catalog JC-5 and name of your nearest Jaeger air station.

THE JAEGER MACHINE COMPANY, Columbus 16, Ohio

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JAEGER



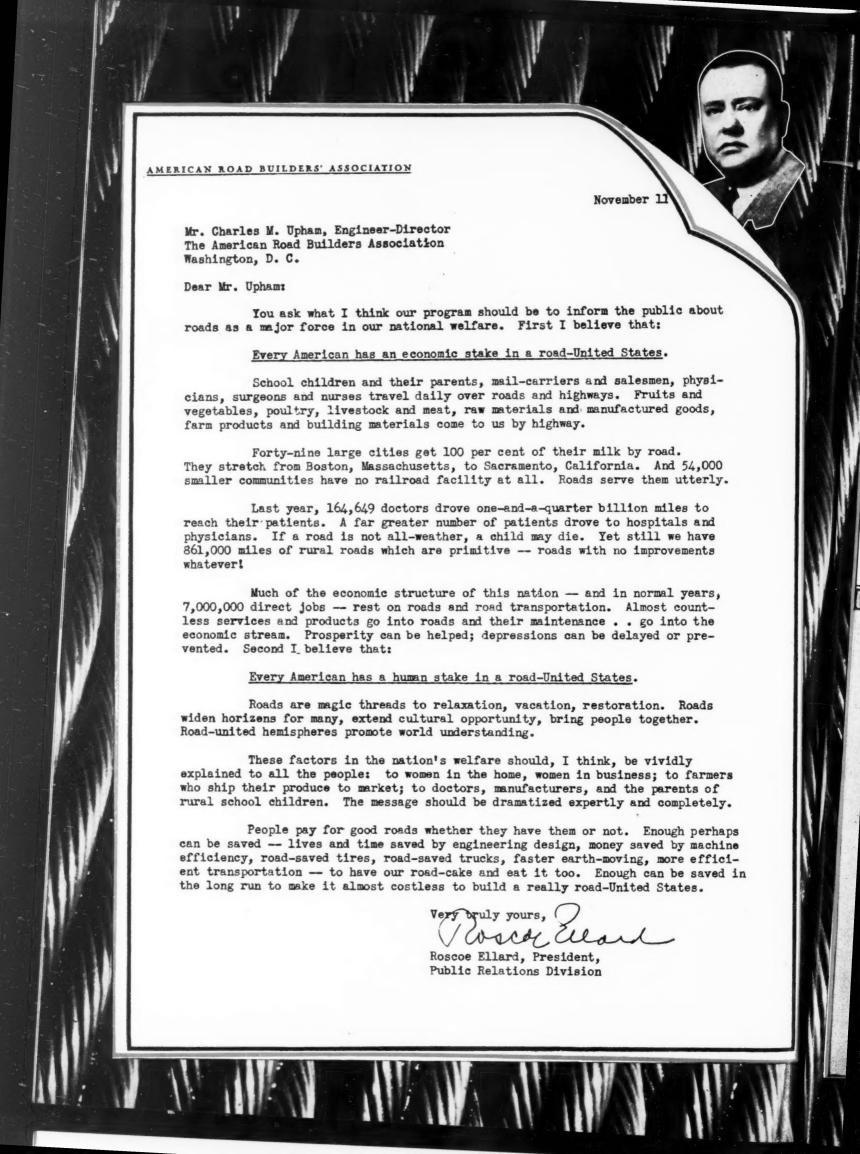
"SPEEDLINE"



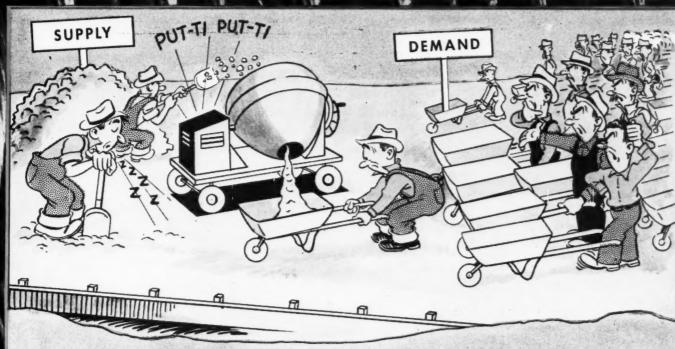
"SURE PRIME"



"DUAL-MIX" TRUCK MIXERS, AGITATORS - HOISTING ENGINES, SELF-RAISING TOWERS - CONCRETE AND BITUMINOUS PAVING EQUIPMENT



"A ROAD-UNITED STATES SHOULD BE VIVIDLY EXPLAINED TO ALL THE PEOPLE . . . " Says Roscoe Ellard, Associate Dean of the Graduate School of Journalism, Columbia University!



IT'S HIGH TIME TO QUIT "PUT-TI-PUT-TING" AROUND AND GET TO WORK ... AND HARD THAT IS!

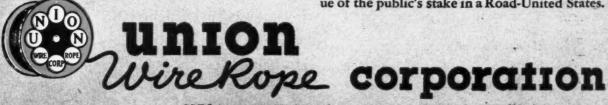
We dislike to bring it up again-but it's no good to run away from the facts. The time and money America has lost since the war through erratic, insufficient, and high cost production would build many miles of roads, streets, railways, waterways and many, many bridges, overpasses, underpasses and airports.

It is these arteries of transportation which have played a tremendous and vital part in making America the most efficient country in the world. Summed up in Professor Roscoe Ellard's letter are basic facts which vividly show that continued expansion and improvement of these arteries are even more important to

America's future than was their construction to America's past progress.

Hard work at the job of production and construction built the arteries over which America traveled to the world's highest standards of living. Only when we get hard to work again will all the people be able to journey on to even higher standards of living.

The responsibility rests on every citizen in proportion to the rewards he expects to get. This means that, individually and collectively, the road building industry and profession is called upon to make the greatest contribution in work and experience and in educating a substantial portion of 140 million citizens on the value of the public's stake in a Road-United States.



Why AQUELLA is a "must" on every concrete masonry unit job!

As everyone in the construction industry knows, the water permeability of light weight concrete masonry units leaves no room for argument! The only possible argument lies in the means and methods of applying an *effective* water barrier to this excellent construction material.

You are well acquainted with the claims made for the many materials designed to "waterproof" concrete masonry units.

But despite these many materials there must be a reason why Aquella is being so widely used throughout the nation today and acclaimed by home owners, architects, engineers, waterproofing contractors and builders! The answer lies in the simple fact that it works on an *entirely new principle!*



Is it any wonder then, that in a cinder concrete block tower test, Aquella withstood the pressure exerted by an 8 ft. hydrostatic head of water, equivalent to approximately 500 lbs. pressure per sq. ft. at the base?

We would like to send you details of this test. It is contained in our booklet, "Aquella and Concrete Masonry Construction." This booklet also contains many illustrations of the uses of Aquella in concrete masonry construction throughout the

United States, and should prove very interesting to all in the construction industry. It is yours for the asking.



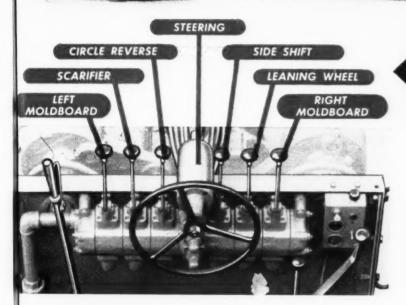
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MOTOR GRADER

Easiest, simplest and smoothest





Galion Features That Assure Top Performance

- Large front tires—same size as rear
- Combination hand and hydraulic steering . .
- Rugged box-type main frame
- Gear-type, four-wheel tandem drive
- Full hydraulic control—low pressure system
- Heavy front axle construction
- Powerful, quick-starting, full Diesel motor . .

Because it is FULL HYDRAULIC

The FULL Hydraulic finger-tip Control on GALION MOTOR GRADERS saves time—gets jobs done quicker. . . . Permits precise adjustments—does more work. . . . Reduces operator fatigue—encourage more alertness on the job.

CENTRALIZED CONTROLS FINGER-TIP OPERATION

All hydraulic control levers are conveniently grouped for ease of operation. The only effort required is finger-tip pressure.

DEPENDABLE and ECONOMICAL

A low pressure hydraulic system is used. Two safety valves automatically prevent over-loading or damaging of the machine. Dependable and economical Grader operation is assured.

See your nearest GALION Distributor or write for Catalog No. 290.

The GALION IRON WORKS & MFG. CO.

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hvaraulic

more WORKING TIME every shift

T'S DIGGING time that counts, and with Bucyrus-Erie % - to 2½-yard excavators you're far ahead in digging time every shift.

Just check with the many Bucyrus-Erie owners everywhere, or with their operators. They'll tell you about the ease with which all adjustments can be made, and how long they last . . . about the accessibility that speeds maintenance . . . about the balanced smooth digging cycle that means no overstressing of any parts . . . about the conveniently grouped, easily manipulated controls that add to digging time by cutting out waste motion and reducing operator fatigue. They'll tell you that moves are

easy to make fast . . . that power is ample . . . that there's plenty of strength in every part to stand up to tough digging . . . and, most important of all, they'll tell you that these Bucyrus-Erie features add up to a higher percentage of actual working time each shift - and consequently to greater output and profits.

you make the most of

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Sarg

BUCYRUS-ERIE

MILWAUKEE, WISCONSIN



For the first time anywhere Maine Steel, Inc. offers a Tractor Backhoe. The addition of the Backhoe to the Sargent Overhead Shovel and Bulldozer now gives you one package of rugged machinery that will do a variety of jobs in any city, town or county. It offers a contractor one kit of tools that will complete from start to finish any number of projects at low cost.

Available in two sizes to fit the Model B and D Cletracs, the Backhoe digs a trench 7 or 8 ft. deep. . . . Like the Overhead Shovel the Backhoe digs easily through hardpan and shale. . . . An automatic bucket cleaner cleans the bucket at every dumping. . . . This makes it a cinch to handle wet, clinging clay.

And the Overhead Shovel is always available for loading sand, gravel and stone in pit and quarry. It will rip up and load hard pavement; and during the winter months it's a great one-man snow loader.

For full information on the Sargent Backhoe and Overhead see your Cletrac dealer or write to us.

MAINE STEEL, INC.

TESTS OF DIGGING TRENCH WITH THE SARGENT BACKHOE

With the trench 3½ ft. deep, in gravel and loam, with some shale ledge, the Sargent Backhoe has dug 200 ft. per hour.

With the trench 5 ft. deep, in gravel or loam under average conditions the Sargent Backhoe has dug 135 ft. per hour.

Trench 6½ ft. deep in clay under ordinary conditions the Sargent Backhoe has dug 75 ft. per hour.

Trench 6½ ft. deep in wet blue clay under very bad conditions the Sargent Backhoe has dug 60 ft. per hour.





Hnnouncing-NEW MODELS

Truck owners will operate them-drivers will drive them-with greater pride than ever before.

They're the new KB Models of International Trucks-outstanding products of advanced design, engineering and research newly styled with flowing lines sharply accented by gleaming chrome, and with 95 features and improvements variously incorporated throughout 15 basic models.

And fully qualified to do their jobs with new economy, new ease of operation, and the rugged stamina for which Internationals are famous!

> They're the finest values in more than 40 years of International Truck history. And International values have always been outstanding - so outstanding that for 16 years more

heavy-duty Internationals have served American commerce and industry than any other

In the complete International Line there's the right truck for every hauling job. And back of every truck is specialized International Service-supplied by the nation's largest company-owned truck-service organization, International Branches-and by International Dealers everywhere.

Yes, the new KB Internationals will be owned and driven with pride-with pride and profit-because these rugged trucks perform with unbeatable economy.

548

Lo

Motor Truck Division INTERNATIONAL HARVESTER COMPANY 180 North Michigan Avenue, Chicago 1, Ill.

TRUCK OPERATORS!

For details of the 95 FEA-TURES AND IMPROVE. MENTS in various models of the new KB Internationals, see your International Branch or Dealer.

Tune in James Melton on "Harvest of Stars" every Sunday! NBC Network. See newspapers for time and station.



ERNATIONA

Barber-Greene

Presents

the NEW SNOW LOADER with new speed, new mobility and new usefulness!



Year-round usefulness; The model 548 may be converted to a B-G Bucket Loader for use during the "no-snow"

tion of the first B-G Snow Loader twenty-five years ago! The model 548 brings pneumatic-tired speed and mobility to the job of minimizing snow storm expense and traffic tie-ups. Completely new in design, the 548 has speed features that include a four-wheel drive with massive tires that buck windrows without slippage. It travels to the job at 10 miles per hour, and clutches may be disengaged for easy towing. For added loading speed, it is designed to allow trucks to travel in the same direction while loading; and its retractable discharge conveyor extends well over the truck cab to minimize spillage. Works right to the curb. Clearance in operating position is only 11 feet, 3 inches. Illustrative literature available on the 548 and also the 538 Crawler-Mounted Snow Loaders by writing Barber-Greene Company, Aurora, Illinois.

BARBER-GREENE COMPANY · AURORA, ILLINOIS



PORTABLE CONVEYORS

Constant Flow Equipment





LOADERS

PERMANENT CONVEYORS

COAL MACHINES

BITUMINOUS PLANTS

February 1947 - CONSTRUCTION METHODS - Page 29



"GOODBYE" to oldfashioned, expensive, time-consuming tractor maintenance methods.

Now . . . truck wheels, idlers and support rollers on all Allis-Chalmers crawler tractors are GREASE-PACKED at the factory. Lubricant needs only to be replenished . . . not replaced . . . once every 1,000 hours. That's . . . ONCE IN SIX MONTHS . . . on a 40-hour week basis! This long interval is made possible by taking full advantage of the improved Positive Seal, exclusive in A-C tractors.

GREASING JOB IS EASY for this operator . . . no fighting through mud to reach truck wheels, front idlers and support rollers! With Allis-Chalmers' 1000-hour truck assembly lubrication, operator can select convenient time and spot to replenish lubricant.

NOW WITH 1,000 HOUR LUBRICATION 22

Truck Wheels Front Idlers Support Rollers

What it means! Relieves you of the responsibility of frequent lubricating attention ... results in less down time for greasing or repairs ... considerably reduces lubricant cost ... adds a factor of safety by assuring adequate lubrication for long operating periods. Result — your maintenance cost is reduced and tractor operating life extended.

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cing tive For the full story of this and other features which make Allis-Chalmers tractors steady, high yardage movers, contact your Allis-Chalmers dealer.

HERE'S HOW IT WORKS . . .

The seal consists of two steel rings, hard and smooth as glass, held tightly together by steel coil springs. One seal ring is stationary, one turns with the wheel. The sealing surfaces are ground to within several millionths of an inch of perfect flatness and are lubricated, as are the tapered roller bearings, from a large grease reservoir sealed inside the wheel. Mud, sand, water and other foreign matter are positively sealed out!



ALLIS-CHALMERS TRACTOR DIVISION - MILWAUKEE 1, U. S. A.

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nd-COLUMBIA EQUIPMENT CO.

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NOVO NEWS

FEBRUARY, 1947





Some idea of the quantity of grit handled by the "Pronto-Prime" during its 2000-Some idea of the quantity of grif handled by the "Pronto-Prime" during its 2000-hour torture test can be obtained from the photographs of the impeller and wear nour torture test can be obtained from the photographs of the impeller and wear plate shown above and the replaceable cut-off shown below. The pictures clearly

show that these cast-iron pieces were actually damaged by the foreign material in the water.







The Novo "stou;-hearted" seal not only withstood the grit but kept on pulling 16 inches of vacuum for 2000 hours. And, as indicated by the photographs above, it was still in good condition ready for more work!

Novo "Stout-Hearted" Seal Lives Up To Its Name — Withstands 2000-Hour Torture Test

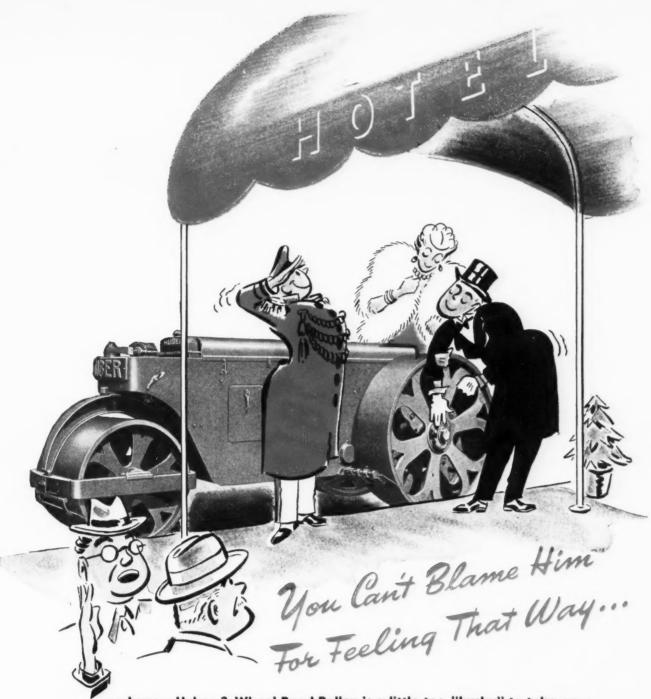
Novo engineers weren't content with subjecting the new "Pronto-Prime" pump to ordinary endurance trials. With an apparent desire to put it through an extreme torture test, they filled water with grit, fly ash. lake sand, gravel—eyen torture test, they filled water with grit, fly ash, lake sand, gravel—even sandblast sand. Setting the pump on a 60-second cycle (20 pumping and 40 recirculating) with a tenand 40 recirculating with a tenfoot suction lift and 25-foot discharge head, they ran it continues. foot suction lift and 25-foot discharge head, they ran it continuously hour after hour—150 hours of the sum of and replaceable cut-off were actually worn and chewed as shown ally worn and chewed as shown by the accompanying photographs.

But the seal—the heart of any self-priming centrifugal pumpuras still pulling 16 inches of vacuum perfectly!

Obviously, this is a much tougher.

Obviously, this is a much tougher Obviously, this is a much tougher test than any pump is likely to face in the field, but it proves beyond the shadow of a doubthow well the Novo stout-hearted seal can "take it."





. . . perhaps a Huber 3-Wheel Road Roller is a little too "husky" to take on a dinner date, but owners and operators are mighty proud of their Hubers—the way they perform—the easy way they handle—their speed, power, and stamina—the economical way they operate—they like to have one handy in case a tough job comes up in a hurry. Huber 3-Wheel Rollers travel in the best of road building society. See your Huber Distributor for a demonstration.

THE COME M

MFG.COMPANY . MARION, OHIO, U. S. A.

HUBER

3 Wheel • 7 and em ROAD ROLLERS MAINTAINERS



Yes, here is a truly tough rope in Round Strand and Flattened Strand constructions—both Preformed and Non-Preformed—designed and fabricated to correctly meet every "heavy duty" Wire Rope requirement... regardless of clime, place or condition.

So, when your next job calls for *economical* service, over a 'long pull'—play safe, and let the Red-Strand be your buying guide.

Your inquiries are always welcome.

"HERCULES"



MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

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OMEN A MOUTHFUL AT EVERY BITE in excavat EXCLUSIVE FEATURES EXPERT DESIGN trenchin SUPERIOR CONSTRUCTION caisson sink handling ehandling

THE OWEN BUCKET CO.

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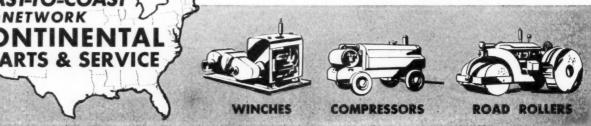
CHICAGO

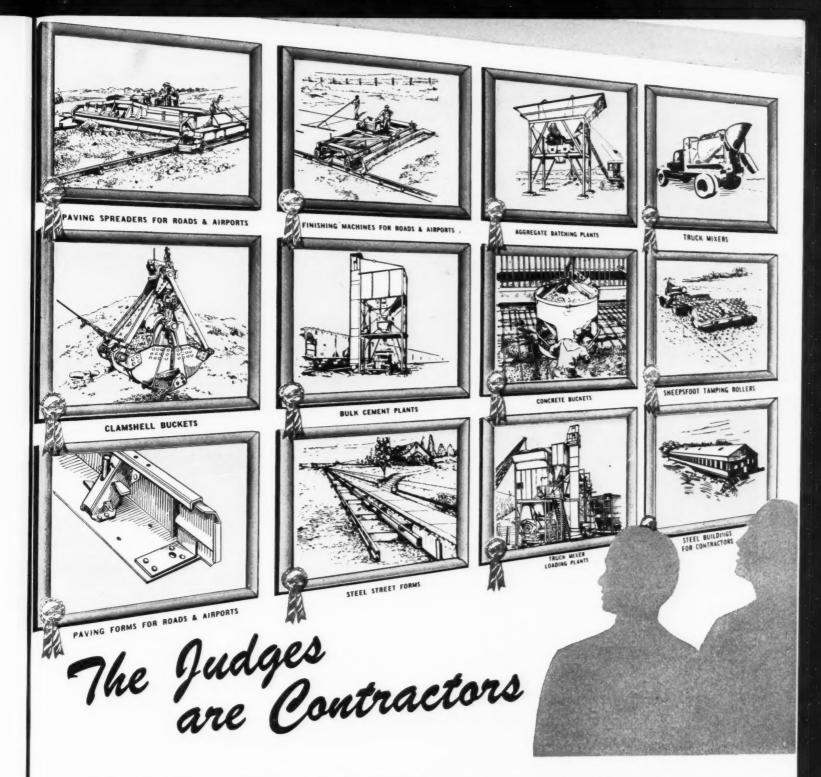
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BERKELEY, CALIFORNIA

BUCKETS







Prize winners . . . all! When judged on the basis of performance and quality, contractors place Blaw-Knox Construction Equipment in the "blue-ribbon" class.

When the requirement is speed — a top-quality paving job in the shortest time with minimum crews — Blaw-Knox can equip the contractor to lay more paving per day at less cost per yard.

If you are interested in that kind of performance, write today for a copy of Bulletin No. 2036 — or consult your nearest Blaw-Knox distributor.

BLAW-KNOX DIVISION of Blaw-Knox Co.

2086 Farmers Bank Bldg., Pittsburgh 22, Pa.

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BLAW-KNOX

R

CONSTRUCTION EQUIPMENT



KILL .. at your Service

At American Bosch, the experience-born skill of thousands of pairs of hands operating modern machines is at the service of the American Diesel industry and its thousands of users.

So, too, are available the experience of engineers who have worked closely with the industry for years . . . fully equipped laboratories . . . productive capacity that has kept pace with the industry's rapid growth . . . field service which keeps the equipment operating as the makers intended which may serve to explain why a large majority of America's Diesel Builders equip their engines with American Bosch Diesel Fuel Injection Equipment. AMERICAN BOSCH CORPORATION, Springfield 7, Mass.

AMERICAN BOSCH

Diesel Fuel Injection



AUTOMOTIVE AND AVIATION ELECTRICAL PRODUCTS

ATLAS LABOR-SAVING SPEED FORMS



The STEEL FORMS That SPEED UP CONCRETE CONSTRUCTION

Builders and engineers make savings of 25 to 50%, and do $\dot{\alpha}$ better job in less time with Atlas Speed Forms—Much better and faster than with plywood.

Easily and speedily erected, stripped and moved. No study or joists needed. Light-weight—anyone can handle them. Ruggedly built of steel—good for indefinite use without repair. Form Cost per sq. ft. per use less than one cent.

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Atlas SPEED forms line up straight and true.

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WHEN EFFICIENCY MEANS PROFIT

SPECIFY GAR WOOD



Wherever there's earth to be moved... clearing, leveling, grading, excavating ... that's where power and efficiency are vital... because power and efficiency mean more work per day... more profit per job. And that's where Gar Wood comes in.

For every Gar Wood Bulldozer and Dozecaster is designed, engineered, and built for operating efficiency . . . with power to spare. Every Gar Wood Dozer and Dozecaster is built to make the nastiest, toughest jobs easy, safe,

and fast. And built with plenty of money-making muscle, plenty of guts ...literally built to take a beating... thanks to Gar Wood down-to-earth engineering.

Want proof? Ask the contractors who rely on Gar Wood Dozers and Dozecasters on the job all over the world, year in and year out. Ask them for an honest appraisal of Gar Wood Road Machinery. Consider. Compare.

And then for your own good...specify Gar Wood!



Right - Gar Wood Cable Dozer

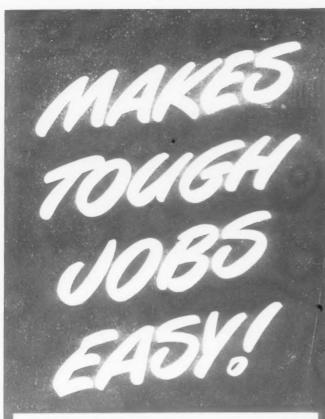
Far Right — Gar Wood 2 wheel hydraulic scrapper

ROAD MACHINERY DIVISION WAYNE, MICHIGAN





HOIST & BODIES · HEATING UNITS · MOTOR BOATS · WINCHES & CRANES



DUAL VALVE

used exclusively on SULLIVAN DRILLS



The exclusive Sullivan Dual Valve is a big factor in the outstanding efficiency of Sullivan Drills. It steps up drilling productivity because it makes air do more work. The Dual Valve provides positive air control on both strokes of piston, giving exact, "cushion control."



THE SULLIVAN LIGHTWEIGHT WASON DRILL
Procumeric tire equipped, positive locking brakes and adjustable from a linerages footage 30 to 80% with mounted 35 to 75 pound hand drills.



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ROCK DRILLS . WAGON DRILLS . COMPRESSORS

W&D R500

SULLIVAN DIVISION

JOY MANUFACTURING CO.

General Offices: Henry W. Oliver Bldg., Pittsburgh, Pa.





The Moto-Paver may be used in either of two ways—by dumping the aggregate from trucks directly into the plant on the road, or by picking up the windrowed material off the road with the special loader unit.



One contractor, after watching the Moto-Paver perform, said: "I've been in this business for twenty years and this is the first real improved method of doing mixed-in-place work I've seen."

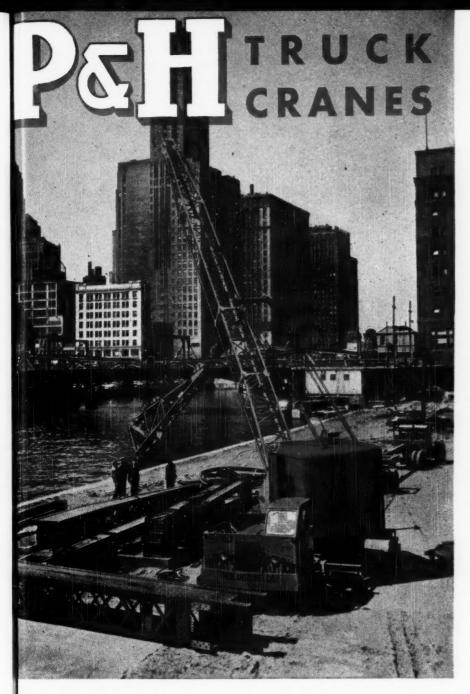
The Moto-Paver mixes and paves as it goes—spreading and laying any type of mixed-in-place bituminous material to any width, thickness and crown condition desired. When the job is finished the Moto-Paver can be driven, under its own power, to the next job. Paving speed is 4 to 50 feet per minute, road travel speed up to 25 miles per hour, mixing capacity 100 to 120 tons per hour.

The Moto-Paver is especially adapted to resurfacing work on county roads and city streets, but is also highly efficient on new construction. Bulletin MP-46 will be sent on request.

HETHERINGTON & BERNER INC. 735 Kentucky Avenue, Indianapolis 7, Indiana



THE COMPLETE TRAVELING MIXER AND PAVER





P&H's extra power really counts on these steady loading operations. Tomorrow this same machine may be miles away . . . perhaps on a delicate crane job . . . "inching" a load as only P&H planetary load lowering can do it.

POWERED FOR THE

Load ...

POWERED FOR THE

Road!

Dual power! One engine for load handling of the greatest possible capacity...another engine geared for travel at regular traffic speeds. That's the combination that makes this new P&H Truck Crane a real cost-saver—on the job—as well as between jobs.

Whether it's crane, dragline, shovel, or other work... whether across town or across country... the P&H dual-powered truck crane gets the job done faster at the lowest possible cost.

Don't miss the new Truck Crane Bulletin TX-87-1.

P & H Added Values

"Size for Size, No P&H Truck Crane Has Ever Been Outlifted"

- Hydraulic control—a new peak in operating ease and safety.
- Greater stability—with exclusive torsion bar-mounted front axle and lower center of gravity.
- Independent Planetary boom hoist—raises or lowers boom smoothly and safely, with or without load.
- Planetary load lowering—permits "inching" of loads, accurately.
- All-welded construction—greater strength.
 Weave-proof frame eliminates sway at boom point.

P&H REMOTE CONTROL AVAILABLE

With this unit you can control all carrier functions (even the horn) by electric push buttons from operator's position inside the crane cab.

HARNISCHFEGER CORPORATION EXCHIDISC SELECTING CRAMES - AND VELICIES PRID BOLISTS - WELDING ELECTROPES - WOTORS

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by SOUTHWEST



THIRTY NEW SOUTHWEST BOTTOM DUMP
WAGONS are doing a big job for Macco
Corporation and Morrison-Knudsen Co. at
Mills Field, California. Each unit averages
70 YARDS PER HOUR, BANK MEASURE,
ON A SIX TO EIGHT MILE ROUND
TRIP HAUL. That's how to move
"muck" and cut costs in
a big way!

Southwest Wagons are engineered to fit YOUR tractor and suit YOUR needs.
30-CU. YD. water level—38-CU. YD. heaped capacity—Special heavy duty construction—Easy operating, air controlled bottom dump doors—Heavy duty bogie wheels—Air operated brakes. •
Write for Bulletins on complete line of Southwest Construction Equipment.

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA. CALIFORNIA





Service

We are emphasizing prompt, efficient service because it is a basic Le Roi policy. It is so important to us that no one holds a Le Roi franchise who doesn't conform to our rigid requirements. Nation-wide, Le Roi service is handled by well-trained, experienced, and competent men. All service outlets are conveniently located to assure you of speedy attention.

Performance

Users tell us that the AIRMASTER line of compressors is portable air power at its best. These fine compressors are now teamed with the well-known line of popular, fast-drilling Cleveland rock drills. For example, the 55-lb. H-111 hand-held drill, thanks to a happy combination of high drilling speed, dependability, and easy holding, is hard to beat. The Cleveland wagon drill establishes new drilling records almost everywhere that it is put to work — unusual flexibility and the power to drill deep holes are mainly responsible.

Mines, with the job of producing metals critically needed in our economy, call on Cleveland drills to help step up their tonnages.

The Future

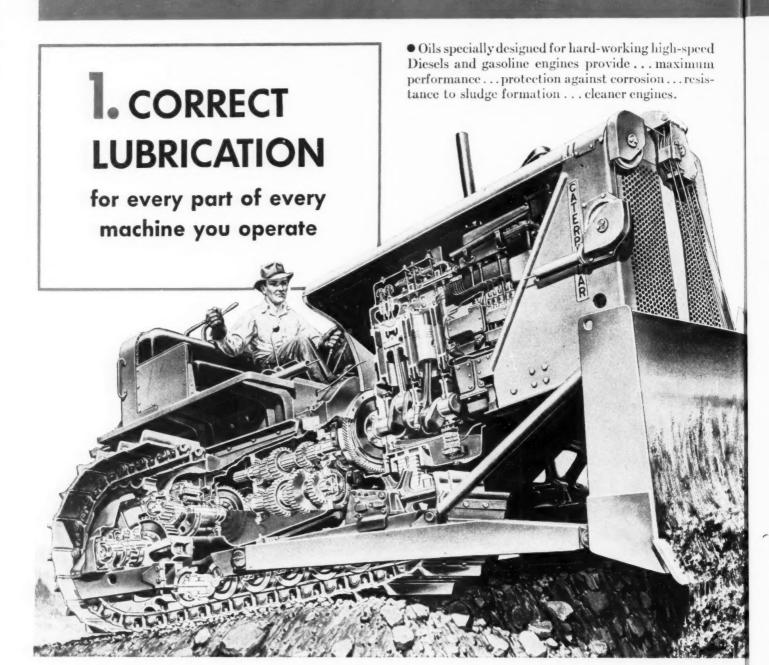
Le Roi and Cleveland Rock Drill are now one — this includes all Cleveland's basic patents and all patents pending. Cleveland and Le Roi designers and metallurgists are all members of the same family. To rock drill users, this combination of talent and experience means, in addition to new standards of service, future developments that will further serve to reduce drilling costs.



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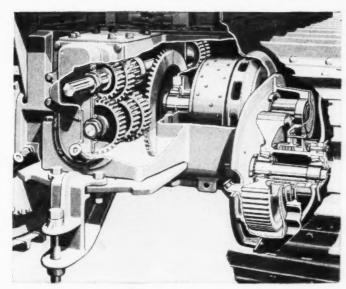
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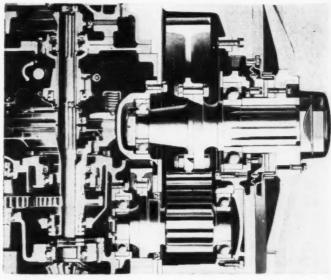
SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation

ods to Help Keep Your Machinery Working!



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• The right lubricants for all types of gears, open or enclosed, offer protection against wear, reduce friction, assure transmission of full power for long periods.



• Correct oils and greases for all bearing applications, anti-friction or plain . . . combat heat, friction and wear . . . stay put to carry the load.

2. TIME-SAVING SERVICE

for all divisions of your operation

Here are just a few of the ways we help you ease tight work schedules, meet and beat contract deadlines:

- 1. Supply you with tested maintenance schedules adapted to *your* equipment, *your* set-up.
- 2. Give you practical help on "problem" machines.
- **3.** Provide information on the Do's and Don't's of Correct Lubrication.
- **4.** Supply your requirements for oils and greases as promptly as possible.
- 5. Help simplify inventory problems. In the field, in the shop, and in the office . . . all through your operation . . . this service saves time. See your Socony-Vacuum Representative for full details.



Tune in THE MOBILGAS PROGRAM—Monday Evenings, 9:30 E.S.T.—NBC

TOURNAPULL JOBS prove

01	ne	RIPS per	Name of Owner	Job Location Type of Material Job Conditions
120	'to	15	Triple Cities Construction Co Binghamton, N. Y.	rp., 3 Tournapulls on 350,000 yd. relocation of Hwy. 16 Blue gumbo, wet clay Was
15	0'	12	Wheeling Engineering & Equinos Engineering & Equinos (Corp., Cleveland, O.	B.R. grade for W.A.L.E.: 3 mile stretch between Dillon
200	' to	13	Meitz-Spears-Dehner Co., Fort Wayne, Ind.	3 Tournapulls on 300,000 yd. realignment of Hwy. 120 Loose sand and Mills
30		21	J. C. O'Connor & Sons, Inc., Fort Wayne, Ind.	4 Tournapulls leveling 300' x 500' factory site at ft, Wayne, Ind. Dry sad. Dry main
400	0'	9	A. L. Riley, Contractor, Macon, Ga.	Coating Co., Macon, Ga. Calico clay and tough 6 to 8% grade on return
400)'	15	Marigold Coal Mining Co., Jasper, Ala.	2 Tournapulls stripping 20' overburden from coal mine Wet, tough-to-load clay. Rainy weather, level haul.
450)′ 1	2.5	Dixon Construction Co., Albany, Wis.	3 Tournapulls, 85,000 yd. grade and drain to reconstruct Topsoil, sand and Light rains, work in close quar-
500)' 1	4.5	Illinois Valley Construction Co Ottawa, Ill.	U. S. 24 from Clifton Hill to Salisbury, Mo. Wet and slippers.
525	′ 1	1	Talbott & Myers Construction Co., Winchester, Ky.	Electric factory at Lexington, Ky. Soggy clay.
550	1	2	R. C. Micotto, Contractor, St. Louis, Mo.	2 Tournapulls landleveling 125,000 yd. subdivision Heavy yellow clay. Normal mid-west dirtmoving
600	1	5	Patterson Construction Co., Monongahela, Pa.	2 Tournapulls strip coal, Southern Greene County, Pa. 20' sandy loam.
600	10	0	Latrobe Construction Co., Latrobe, Pa.	3 Tournapulls fill 65' trench to prevent spread of fire Tough clay and fine Return up 7% grade, six shale,
600	17	7	Augustine Construction Co., Philadelphia, Pa.	2 Tournapulls building 250,000 yd., 50' dike for Dirt, rooted rock, Haul up 170'
700'	14		Potts & Callahan Contracting Co., Inc., Baltimore, Md.	4 Tournapulls on 1,200,000 yd. relocation of Hwy. 22 Shale, small % of Hand
750′	11	-	& R Coal Co., Clarksburg, W. Va.	2 Tournapulls stripping 300,000 yd. hill at coal mine, Sandy clay and soep 20% grade on return haut.
800′	10		i. R. Batson Co., Birmingham, Ala.	Jusper, Ala. 10% acres for coal mine near 3' shale, 18' clay 10% acres
800'	11	c	alumet Paving Co., Indianapolis, Ind.	3 Tournapulls on 7 ½ miles of 24' double-lane reconstruction of U. 5. 52 between LaFayette and Common earth. Lebanon, Ind. Material saturated by spring
975'	11	c	ameron-Joyce of Keokuk, Ia., and O'Dell-Riney of Hannibal, Mo.	7 Tournapulis on 800,000 to 900,000 yd. Santa Fe R.R. Sticky clay, hard 10% grade on haul and sale.
1100	11.5	2 R	ieth-Riley Construction Co., Goshen, Ind.	3 Tournapulls grading 1300 acre, 300,000 yds. for new 90% sand mixed with loam. Loose, soft material,
1200	7	R.	W. Cleveland & Co., East Orange, N. J.	7 Tournapulls on 360,000 yd. grading for race track, Wet and frozen clay Rain, freeze, thaw. Material
1200′	8		idgeport Core Sand Co., Saginaw, Mich.	Tournapulls widen test runway for General Motors Clay, topsoil, sand Proving Grounds, Miltord, Mich.
1300′	11		W. Hable & Sons, Corsicana, Tex.	Size boolders. 5 Tournapulls on 500,000 yd. relocation of 1312 miles Sand, clay of Hwy. 26, 3 miles south of Henderson, Tex. Size boolders. Sand, clay and Steep grades on spread.
1350'	10		Vaugh-Haynes Co., Detroit, Mich.	10 Yournapulls on 4½ million yd. airport at Dubuque, Sod and black dirt. Hilly,
1500'	11		nley H. Arkwright, Inc.;	3 Tournapulls on 386,000 yd. relocation on U. S. 10 Clay, sand, loam, between Billings and Huntley, Mont. gravel and blasted Several hundred face to
1500'	9		th & Olson, Inc., ioux City, Iowa.	5 Tournapults on 500,000 yd. stripping of Marquette 6 to 8' of silt, 2 to 3' 40' averbund.
1750'	9			Tournapulls stripping 100,000 yds, from Lincoln Sand & Gravel Co. pit, Lincoln, III. Stripped material
1800	11		ser Construction Co., reeley, Colo.	Fournepulls on 1,500,000 yd. earthfilled Granby Dike Clay and argue! Rainy, 8200' although
1800'	12			Tournapulls handle 99% of million yd. airport at Common earth. Average.
1875'	10			Tournapulls strip clay mine for Kentucky-Tennessee Sticky, wet clay, sand Landard dawn 250.
2000'	11		*	Tournapulls strip and load gravel from 2 sq. miles Sand and clay over- Strip knolls, 2' to 10' deliver
2000'	6		t-Spears-Dehner Co., 3	Tournapulls on 300,000 yd. realignment of Hwy. 120 Loose sand and Hilly, haut reads of least
2000'	10	Mark	ham & Brown-Kearney. 5	Tournapulls grade 780,000 yds. for additional facili. Mucky top soil, yel. tics of Dallas Redbird Airport, Tex. Tow clay and layer Stone required blastics
				of limestone. rooting,





ETOURNEAU JOB-PROVED TOURNAPULLS

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HAUL	TRIPS per hour	Name of Owner	Job Location	Type of Material	Job Conditions
2000'	7	Rhoten & Frysinger Construc- tion Co., Columbus, Ohio.	3 Tournapulls moving around 300,000 yds. per year on continuous stripping at Marble Cliff Quarries.	Sandy clay, gravel some boulders.	1400' hauf up 4 to 7% grade. Spread down 8 to 10%.
2100'	7	Coffee Construction Co., Eastman, Ga.	4 Tournapulls strip 150,000 yd. of 40' overburden for Penn-Dixie Cement Co., Clinchfield, Ga.	Topsoil, clay, rock and fuller's earth.	Rock and fuller's earth, rooted.
2250'	7	Winston-Utah-Vinnell,	6 Tournapulls on flood control, Lytle & Cajon Creeks, San Bernardino, Calif.	Loose, wash sand and	Haul from wash to top of leves.
2600'	7	Circle Construction Corp., White Plains, N. Y.	13 Tournapulls moving 2 million yds. of $2\frac{1}{2}$ million yds. at Long Island Idlewild Airport.	Dredged acean sand.	Saturated to extremely dry
2640	5.5	Nathan A. Moore, Alhambra, Calif.	9 Tournapulls moving 500,000 of 700,000 yds., to grade camp site, Oceanside, Calif.	Sand, stone, heavy	Haul down 40 to 50% grades,
2640	6	A. Guthrie & Co., Inc., St. Paul, Minn.	9 Tournapulls on relocation of 7 miles — $2\frac{1}{2}$ million yds., Northern Pacific R.R. between Glenn Ullin and New Salem, N. D.	Tough blue clay, hard scoria, seams of coal, rooted.	350' of adverse 10 to 20% grade on haul, 1200' of 7 to
	5.25	Attapulgus Clay Co., Amsterdam, Ga.	4 Tournapulls on bench-stripping of 5 million yd. fuller's earth mine.	Fuller's earth.	500' of 10% adverse grade
2700′	6.5	C. C. Moore Construction Co., Panama City, Fla.	3 Tournapulls on 81/4 mile, 200,000 yd. road construc- tion into Apalachicola National Forest, Fla.	Swamp sand and muck,	Year around production. "Wettest road job in Florida"
2800'	5	Straits Construction Co., St. Ignace, Mich.	3 Tournapulls on 110,000 yd. relocation of Hwy. 28, near Raco, Mich.		through swampy jungle. Soft and loose material in cut. Poor footing.
3000′	7.5	Illinois Valley Construction Co., Ottawa, Ill.	4 Tournapulls grading 4.85 miles, 265,000 yds. on U. S. 24 between Clifton Hill and Salisbury, Mo.	Sticky clay.	Wet from heavy rains, slippery.
3100′	5.4	Gradle Bros., Inc., Carmel, Ind.	3 Tournapulls on 160,000 yd. fill for bridge approaches—each 2600' long, 26' deep, Indianapolis, bypass.	Common earth and sticky clay.	
3200	4	C. T. Wilson Construction Co., Clayton, Miss.	19 Tournapulls grading 1,450,000 yd. factory site and dock for International Harvester at Wood River, Ill.	Mississippi River silt	
3500	6.5	M. J. B. Construction Co., Stockton, Calif.	5 Tournapulls handle 80% of 350,000 yd. highway job between Grant Line Road and Mossdale, Calif.	fine silt, mixed clay and loam.	Good haul roads, maintained by grader and water sprinkler.
3600'	5.8	Circle Construction Corp., White Plains, N. Y.	13 Tournapulls handling 2 million yds. of 2½ million yd. Long Island Idlewild Airport, N. Y.	Dredged acean sand.	Solurated to extremely dry.
3700'	6	Cia. Mexicana Constructora Azteca, S. A., y Cia. Utah. S. A., Mexico.	14 Tournapulls on 4 million yd. earth and rock filled dam, 4500' in length, 80' high, at Hermosillo, Sonora, Mexico.	Clay and loam.	Trained local laborers operate Tournapulls.
3900'	5.5	Raemisch-Madden Co., Middleton, Wis.	11 Tournapulls on 13 mile, 400,000 yd, grading on U. S. 66 near Chenoa, III.	Wet pit-run gravel,	Heavy rains, wet and spongy.
3960'	6	Eblen Construction Co., Atlantic, Iowa.	4 Tournapulls on 300,000 yd., 5 mile road improvement of U. 5. 34 near Glenwood, lowa.	Yellow clay and hardpan.	150' of return up 20% grade.
4000′	6	A. Teichert & Sons, Sacramento, Calif.	4 Tournapulls on airport at Goleta, Calif. (Strip near- by hills to raise tide flats.)	Sandy loam.	Normal.
4000'	5	Clyde Wood, Contractor, Los Angeles, Calif.	6 Tournapulis on Lytle Creek Channel change, 27' deep, 40' bottom, near San Bernardino.	Loose, dead sand.	Tough loading and climb steep grades out of channel cut.
4200'	5.5	Circle Construction Corp., White Plains, N. Y.	13 Tournapulls handling 2 million yds. of $2 \frac{1}{2}$ million yd. Long Island Idlewild Airport, N. Y.	Dredged ocean sand.	Material saturated to extremely dry.
4200'	4	Paul Miller Construction Co., Grand Rapids, Mich.	3 Tournapulls leveling 225,000 yd. plant site in Michi- gan Sand Dunes near Grand Rapids, Mich.	Abrasive, fine white sand and clay.	Tough-to-load, haul down 15%, return up 10%. Winding road.
4500'	5	Claussen-Dunn Construction Co., Augusta, Ga.	2 Tournapulls on 300,000 yd. bridge approaches and widening Hwy. 25 south of Millen, Ga.	Sand with occasional clay spots.	Heavy rains.
5280'	3.7	Rhude & Fryberger, Duluth, Minn.	3 Tournapulls strip Scranton Mine, Hibbing, Minn. (Moved 53,800 yds. in 1454 unit hours.)	Sandy overburden with gravel, clay	4 to 10% adverse grade,
5280'	5.6	Keeble & Brown, San Mateo, Calif.	5 Tournapulls on 230,000 yd. fill for industrial sites in South San Francisco, Calif.	Shale and serpentine	Up long 4% grade on return with last 300' at 15%.
6400'	3.5	A. Guthrie & Co., Inc., St. Paul, Minn.	9 Tournapulls on relocation of 7 miles, 2½ million yds., Northern Pacific R.R. between Glenn Ullin and New Salem, N. D.	Tough, blue clay, hard scoria, seams o coal, rooted.	350° of 10 to 20% adverse grade on haul, 1200° of 7 to 8% up grade on return.
11,880	2	J. E. Milam Construction Co., Birmingham, Ala.	4 Tournapulls spreading 50,000 yd. sub-base on U. S. 11 relocation. Tuscaloosa to Cedar Cove, Ala.	Layered sand and clay.	Load down 20 to 25% grade. Hauled over sub-base fill.
15,840	2	Raemisch-Madden Co., Middleton, Wis.	11 Tournapulls on 13 mile, 400,000 yd. grading U. S. 66. Chenon, III.	Wet, pit-run gravel.	Hauled 800' from pit to road. 3 miles over old pavement.
21,120	1	H. B. Zachry Co., San Antonio, Tex.	6 Tournapulls on 15,000 yd. street grading in Sar Antonio Subdivision, Tex.	Damp, tight, pit-ru gravel.	n Travel through traffic over paved roads.

SHORT hauls or long, all types of scraper materials, under all job conditions, big jobs, little jobs, anywhere dirt is moved . . . Tournapull speed, versatility and low cost of operation add up to lowest-net-cost-per-yard. Check YOUR job records against those listed above . . . then see your LeTourneau Distributor for complete information on what high-speed, rubber-tired Tournapulls can do for YOU.

LeTourneau Products: Tournapulls*, Angledozers*, Bulldozers, Tiltdozers*, Carryall * Scrapers, Power Control Units, Rooters*, Tournatrailers*, Tournacranes*, Tournatrucks*, Sheep's Foot Rollers, Tournarope*, Tournaweld*, Tournalifts*.



LIFTING CAPACITY UP 50%

When You Mount KOEHRING ON RUBBER

High lifting capacity of the Koehring 304 goes up to 40,000 lbs., is increased by 8½ tons over crawler mounted capacity, when the 304 is mounted on the Koehring Truck Crane Chassis. Lifting Capacity of the Koehring 205 Truck Crane is up proportionately, to 20,000 lbs. Koehring 304 Cruiser Crane (one-man operated, rubber mounted) lifts 29,000 honest pounds. Koehring 205 Cruiser lifts 14,500 lbs.

Safely stepping up lifting capacities as much as 50% over crawler capacities is possible only because every Koehring base machine is designed with more than ample reserve strength. Big safety factors enable you to turn every bit of extra stability gained in rubber mounting into extra profitmaking lifting capacity.

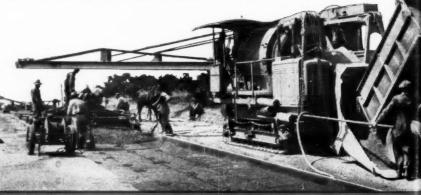


One-man operation saves labor cost as this Koehring 304 Cruiser Crane handles demolition to make room for new construction.

HAULING OR PAVING-KOEHRING MEANS HEAVY-DUTY



Koehring Dumptor, built by a shovel manufacturer for work with shovels, dumps in 1 second, never turns on shuttle hauls.



Koehring 34-E Twinbatch Paver, long the reliable Heavy-Duty leader in its field, gets highway jobs through on schedule, in the money.



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When loading is tough and you can't keep trucks moving fast enough for profit, put your money on a Haiss. It's the Loader that's built to crowd a stock pile or bank and move it up to 8 yd.-a-minute speed... the Loader that's engineered to dig anything a man can shovel and do its own clean-up scraping. Haiss

Loaders cost more, because they're worth more. They're worth more, because they're superbly engineered for greater mechanical reliability, greater overall operating economy. Investigate now how Haiss Hi-Speed Loading can save time and lower cost of your materials handling. Catalogs containing complete information will be mailed promptly on request.

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Distributors in all large cities.



PORTABLE CONVEYORS

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CLAMSHELL BUCKETS



\$71/2 billions of heavy construction in 1947! Millions and millions of tons of aggregate will be needed.

Here's the line of modern, portable crushing and screening plants that will help you make more money for producing that aggregate. Every unit is made of the finest possible material and skillfully engineered to assure long, trouble-free operation, low-cost production and flexibility to meet every operating condition.

- 100 to 150 tons per hour of 1" material are easy for the big Cedarapids Master Tandem.
- The Cedarapids Junior Tandem is similar to the Master but smaller in size.
- The Cedarapids Pitmaster is our smallest portable straightline crushing plant but owners say there's nothing small about its production.
- The Cedarapids Unitized Plant is the most versatile, portable crushing, screening and washing plant ever offered. Will handle rock or gravel, dry or washed—with almost any desired
- The Cedarapids Portable Hammermill plant is the ideal unit for large production of agstone and road stone.

See your nearest Cedarapids dealer for details. When you buy a crushing plant - buy the best - buy Cedarapids.

THE IOWA LINE

of Handling Equipment Includes

BELT CONVEYORS—STEEL BINS **BUCKET ELEVATORS** VIBRATOR AND REVOLVING SCREENS FEEDERS-TRAPS

PORTABLE POWER CONVEYORS

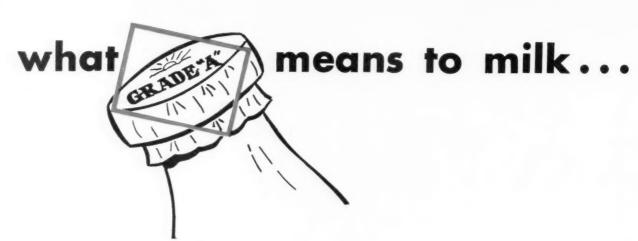
PORTABLE STONE PLANTS

ROCK AND GRAVEL CRUSHERS PORTABLE GRAVEL PLANTS REDUCTION CRUSHERS BATCH TYPE ASPHALT PLANTS CONTINUOUS MIX TYPE ASPHALT PLANTS DRAG SCRAPER TANKS WASHING PLANTS KUBIT IMPACT BREAKERS HAMMERMILLS











means to mixers!

On a milk bottle, "Grade A" is your protection ... your guarantee of top quality. Similarly, the AGC rating plates are your protection on mixers and pavers . . . your guarantee of capacity and performance.

The AGC rating plates eliminate the guesswork . . . the "blindfold" methods of equipment buying. They are your assurance in advance that a mixer or paver will deliver its rated capacity . . . will live up to the standards set up by the Mixer Manufacturers Bureau.



Next time you're in the market for a mixer or paver, insist upon equipment wearing the AGC Plate. You'll find you'll be making job estimates . . . not "guesstimates."

MIXER MANUFACTURERS BUREAU

Affiliated with the Associated General Contractors of America, Inc.

Member Names

Chain Belt Company Milwaukee, Wis.

> Construction Machinery Co. Waterloo, Iowa

> > Koehring Company Milwaukee, Wis.

Ransome Machinery Co. Dunellen, N. J.

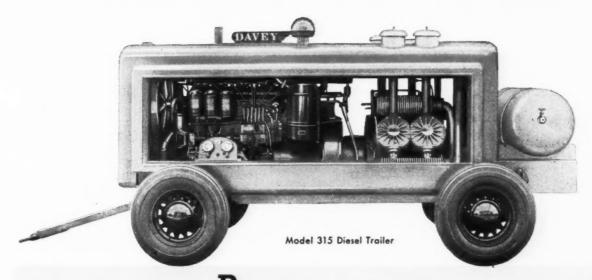
Kwik-Mix Company Port Washington, Wis.

The Foote Co., Inc. Nunda, N. Y. The Jaeger Machine Co. Columbus, Ohio

The T. L. Smith Company Milwaukee, Wis.

The Knickerbocker Co. Jackson, Mich.

there's a DAVEY FOR EVERY COMPRESSED AIR NEED

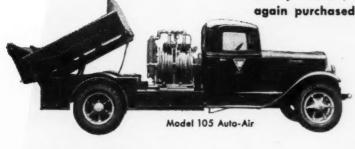


Javey Compressors are built for just one class of buyers—those who demand the best!

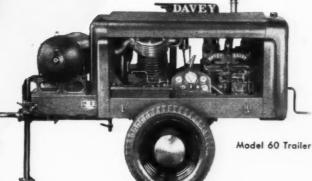
They're consistently preferred by users who keep careful records of initial cost, operating and maintenance expense . . .

Proof of this preference is found in the five years prior to the war when 97 per cent of the Davey owners, who bought new compressors, again purchased Daveys.





In addition to a complete line of trailer and Auto-Air units (60 to 315 c.f.m. capacities), Davey builds • Mobile Machine Shops • Track-Air Compressors • Departmental (Industrial) Units • Truck Power Take-offs • Mine and Railway Compressors • Power Saws • Portable Lighting Equipment.



DAVE

There are Davey Dealers in Principal Cities

DAVEY COMPRESSOR CO.

KENT, OHIO

Thos SUMP PUMPS

Keep Pumping!



... Improved Lubrication Assures Peak Efficiency

In Sump Pumps, the *impeller shaft bearings* are the most vulnerable parts, with premature failure causing undue job delay and expense. Thor safeguards these vital points by a large grease reserve that is force-fed under continuous air pressure—pressure that further prevents foreign matter from working into the bearings. Because of this *exclusive feature*, Thor Pumps can be operated continuously up to a full shift without regreasing.

Thor Sump Pumps are designed to operate efficiently in clean or dirty water; in oil, sludge or sewage—either partially or fully submerged. Your nearby Thor Distributor will gladly demonstrate them as the economical answers to your sump-water problems.

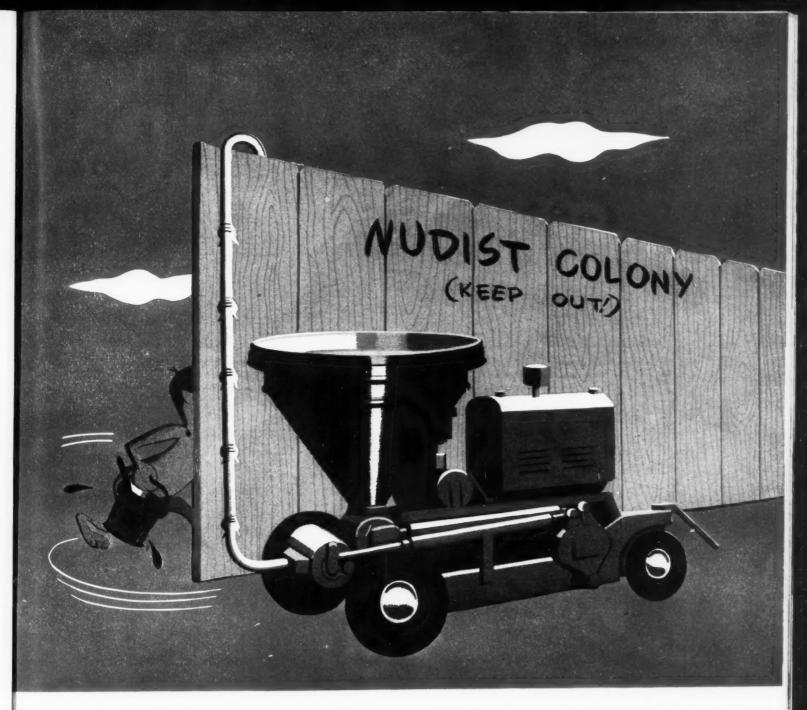
INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. Jackson Blvd., Chicago 6, Illinois

Birmingham Boston Buffalo Cincinnati Cleveland Denver Detroit
Houston Los Angeles Milwaukee New York Philadelphia Pittsburgh
St. Louis St. Paul Salt Lake City San Francisco Toronto, Canada London, England



PNEUMATIC TOOLS . UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS . MINING AND CONTRACTORS TOOLS



"It's easy to get in with Pumpcrete!"

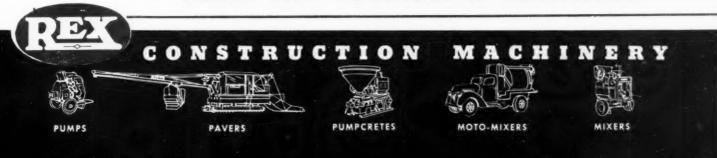
It's easy to place concrete in unusual or inaccessible locations with Rex Pumpcrete, the pump that pumps concrete through a pipe line. Jobs that could only be placed at prohibitively high costs with ordinary methods become simple with Pumpcrete's flexibility.

For example, where a structure jumps a river or gorge . . . where access roads are difficult to build or maintain . . . where traffic interference presents

a problem . . . where expensive preparatory work is required . . . Pumpcrete with its ability to transport on one or more levels, to elevate, lower and distribute concrete in one operation is the logical placing method.

For facts on how Pumpcrete can help you, see your Rex Distributor and write for your free copy of Bulletin No. 466. Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wisconsin.

CHAIN BELT COMPANY of MILWAUKEE





ERHAT HAS EVERYTHING!



TRACTION

things that

ght-line

conditions

places the rear end of the machine where it will most effectively resist the side thrust of the load on the blade; enables the blade to move more material, farther and faster.



SIDE SHIFT

makes it possible to sideshift a loaded blade while the machine is moving, with no change in working angle, and no tendency for one end of the blade to leave the road and the other end to gouge into it.



With the machine running straight, the blade can be extended 90 inches beyond the outside line of tires. Using Rear Steer makes it possible to reach 10 feet, 3 inches beyond the rear tire—a figure not even approached by any other grader.



All-Wheel Steer greatly simplifies the operation of grading in reverse-should it ever be necessary with the highly maneuverable "99-H"-by providing perfect steering control of both ends of the machine.

No Motor Grader without All-Wheel Drive and All-Wheel Steer can hope to equal the all-around operating efficiency of an Austin-Western "99" Power Grader. This was true of the "99" and "99-M." It is even more true of the "99-H" with its exclusive All-Wheel Drive, All-Wheel Steer, Controlled Traction and Precision Sideshift, PLUS High-Lift Blade, Extreme Blade Reach and Completely Reversible Blade.

With its 76-horsepower engine and 13-foot blade, the "99-H" moves maximum quantities of material; works in soft or wet ground where other motor graders cannot

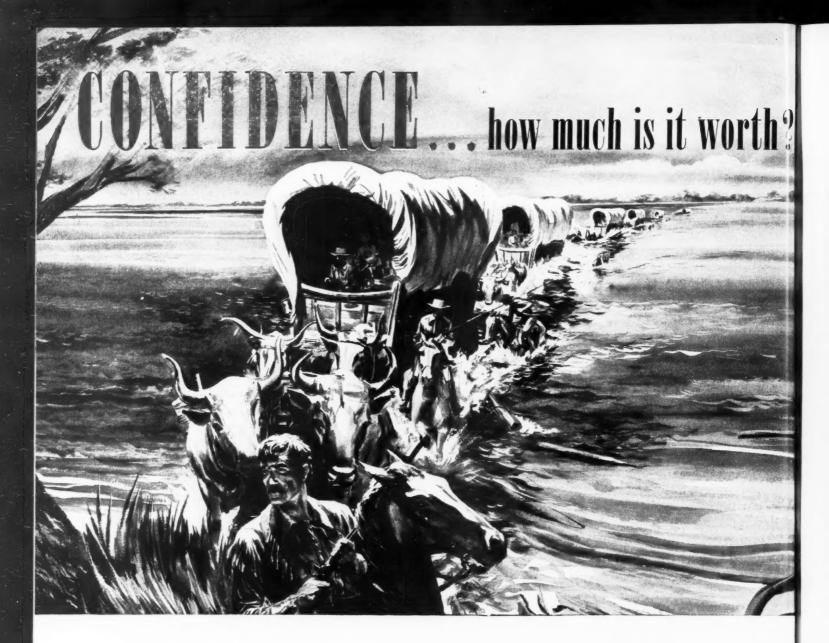
work; climbs banks and crosses gulleys; works on narrow, winding roads, and, in general, completely outperforms ordinary motor graders.

The widest variety of attachments is available-Scarifier, Snow Plow, Snow Wing, Bulldozer, Roller, Loader -each just that much more effective than it would be on an ordinary motor grader, by reason of All-Wheel Drive and All-Wheel Steer.

Your nearby Austin-Western distributor will be glad to tell you the whole story of "The Power Grader That Has Everything."

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.







IN 1844, three years before Alexander Graham Bell was born, and long before the first Prairie-Schooner crossed the Mississippi River, John August Roebling's confidence in the suspension principle of construction so impressed the engineers of the State of Pennsylvania, that they authorized him to build the world's first suspension aqueduct.

How much is his confidence worth to all the thousands of engineers who followed and to humanity in general that have benefited from his pioneering venture?

And how much is the confidence of the John A. Roebling's Sons Company in the future of American industry worth to you, that keeps Roebling development and Roebling products in the lead?

Roebling's greatest asset is your confidence in Roebling and its confidence in your future. That is why Roebling's every effort is dedicated to the preservation of this confidence—your's and Roebling's.

Why We Recommend "Blue Center" Steel Wire Rope

Here at Roebling, we believe the finest steel used in the manufacture of wire rope is "Blue Center." It was developed and is produced in our own open-hearth furnaces. From this steel alone we make our "Blue Center" Steel Wire Rope...in a complete range of sizes and constructions...in preformed or non-preformed types. This variety is so wide that you can find the right rope for your particular need.

We are confident that this rope will give you the absolute peak in dependability and service.

Your Roebling Field Engineer can be of help to you in choosing this *right* rope. Thoroughly grounded in wire rope and all types of rope-operated equipment, he'll see that you get the greatest returns from your wire rope investment. Help yourself to his specialized knowledge...call him at our nearest branch office.

JOHN A ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities

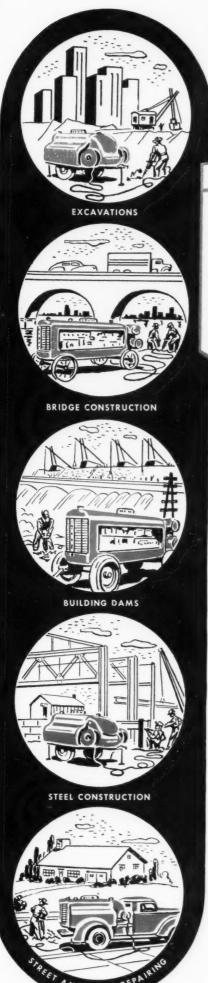


ROEBLING

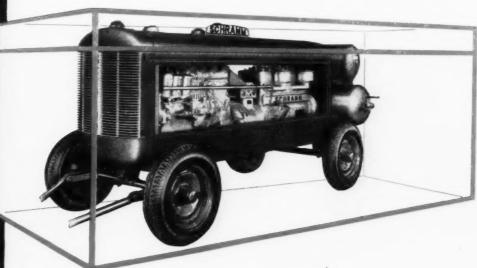
A CENTURY OF CONFIDENCE



Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts • Electrical Wire and Cable • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Lawn Mowers



PACKAGED AIR



FOR THE CONSTRUCTION FIELDS

Packaged air, when and where you want it, is all in a day's work for Schramm Compressors. Portability and mobility are "musts" in the variety of jobs that crop up in the construction field. These needs have been designed and built into Schramm Air Compressors. Yes, in a single "package" you get a steady flow of air, at the pressure you need, by pressing a button.

From a single Schramm basic packaged unit come these and many other construction operations: Rock Drilling, Tamping, Concrete Placing and Breaking, Spading and Digging, Sand Blasting, Sheeting and Pile Driving, Culvert Placing, and many other applications of air-powered tools including chain saws. In fact there are very few categories of construction work... and few corners of the globe ... in which Schramm Air Compressors are not serving.

Details of Schramm Compressors, and the advantages they offer, are contained in a new, fully illustrated booklet . . . yours for the asking. Write today for your free copy of Catalog 45-A.

WEST CHESTER THE COMPRESSOR PEOPLE PENNSYLVANIA

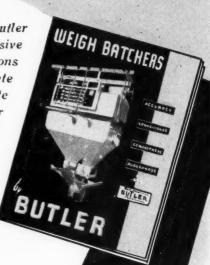
VEADY MIXED CONCRETE PLAN Butler Ready Mixed, Concrete Plants, 24 pages of illustrations.

TO HELP YOU IN YOUR 1947 Planning!

These four profusely illustrated Butler Bulletins show in clear, comprehensive detail, Butler engineered installations and equipment in Ready Mixed Concrete Plants, Central Mixing Plants, Concrete Products Plants, Weigh Batchers and other materials handling units. . . . In over a quarter of a century of experience in

planning, designing and building such specialized construction equipment, Butler Engineers have encountered and have ingeniously solved many highly unusual problems. These Butler solutions, - illustrated with photographs are shown in these Bulletins. . . . Any one or all of the books are yours for

the asking.



BULLETIN B-150F Completely describing and illustrating Butler Weigh Batchers, 12

BULLETIN B-260 From Central Mixing Plants to the ingenious Butler Carscoop. 24 pages of materials handling equipment.

NOTE-BULLETINS 150F AND 210C SHOWN AT RIGHT ARE SCHEDULED FOR RELEASE APRIL 15TH, 1947. BECAUSE OF PAPER SHORTAGES, THE EDI-TION WILL BE LIMITED. PLEASE ENTER YOUR REQUEST NOW.



BULLETIN B-210C Emphasizing design and use of Butler Portable Bulk Cement Plants. 16 pages.

BUTLER BIN COMPANY WAUKESHA, WISCONSIN

Please send me the following free Bulletins:

BULLETIN B-185 BULLETIN B-260

BULLETIN B-150F (See note)

BULLETIN B-210C (See note)

COMPANY

Page 62 — CONSTRUCTION METHODS — February 1947



To decrease the time, the cost, and the toil
Of getting the subgrade as smooth as oil
Use a Buckeye Finegrader for the difficult role
Of removing each bump and filling each hole.

Your local Buckeye dealer will be glad to give you complete information on all Buckeye equipment. On road building projects of every type, Buckeye equipment today is proving itself dependable, fast, low in maintenance and operating costs. Write for bulletins on Buckeye road working machines; we'll send these and the name of your nearest dealer promptly.

BUCKEYE TRACTION DITCHER
Division of Gar Wood Industries, Inc.

FINDLAY

OHIO

Cultivate Good Buying Habits . . . Now

Buckeye

CONVERTIBLE SHOVELS . ROAD WIDENERS . TRENCHERS . SPREADERS . FINEGRADERS



Rainwater that settles under a road Causes cracks and "sinks" from the traffic load. For fast drainage of by-way and highway Do the trenching the low cost Buckeye Way.

For numerous jobs needing power and speed Here's a Buckeye machine that stays in the lead. For earth moving, material loading, digging out rubble Nothing equals a Buckeye "Vacuum Control" Shovel.

And must be made wide.



Your Best Bet for Levee Work INTERNATIONAL Diesel Crawlers



Efficient Dirt Moving Hems in Old Man River

Three International TD-18 Diesel Crawlers moved 150,000 cubic yards of black gumbo with some sand and clay, in 60 calendar days. They were rebuilding a levee near West Memphis, Arkansas, on the Mississippi. Hauls were as long as 1200 feet, daily yardage as high as 30,000. And they loaded at small borrow pits without pusher assistance to get capacity loads in 10-yard scoops.

Performance like this points up the superiority of International Diesels for earth-moving. Their 4-cyle valve-inhead engines provide dependable, economical power. Perfect weight distribution, adequate ground contact, rugged construction and extremely durable moving parts give them the ability to handle the toughest earth-moving jobs with ease.

Their built-in, quick-starting system means that they waste no time getting to work. And the little time required



This International TD-14 with Trail-builder is shown leveling a haul road on approach to the levee. It also dressed the levee to grade and leveled off the dirt deposited by the three TD-18's and scoops. This is a fast, powerful and easy-to-handle Diesel Crawler—ideal for this work.

for maintenance means more productive hours in every day.

Yes sir! Your best bet for levee work, as for other earth-moving, is the International Diesel Crawler. Get the latest information, facts and figures on International Crawlers, Wheel Tractors, Power Units and Diesel Engines now in production, from the International Industrial Power Distributor near you.



Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue, Chicago 1, Illinois

Tune in James Melton on "Harvest of Stars" every Sunday, NBC Network

INTERNATIONAL Industrial Power

CRAWLER TRACTORS . WHEEL TRACTORS . DIESEL ENGINES . POWER UNITS

ONE-PIECE Skeletons FOR SKYSCRAPERS

Silently, almost stealthily, arc welding swiftly unites steel members into one-piece skeletons for today's skyscrapers. Combined with oxyacetylene cutting for various operations of fabrication, arc welding saves steel...assures full strength...and permits wider architectural latitude.

To help you solve the many perplexing problems involving this modern method of erecting buildings, Airco has just published "Manual of Design for Arc Welded Steel Structures"—a handy, useful book that brings you a wealth of information covering design, materials, inspection, estimating, and engineering control of welding and related operations...tables of standardized welded connections for all sizes of beams...AND a series of diagrams for the rapid design of special connections.

But see this invaluable new manual for yourself—just mail us your check or money order for \$2, and we will send the book to you at once...look the book over for ten days; then, at the end of this period, if it does not live up to your expectations, simply return the book to us, and we will refund your money.

Write today; address: Air Reduction, Dept. CMD2-1, General Offices, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas.





AIR REDUCTION

Offices in All Principal Cities

HEADQUARTERS FOR OXYGEN, ACETYLENE, AND OTHER GASES . . . CARBIDE . . . GAS WELDING AND CUTTING APPARATUS AND SUPPLIES . . . ARC WELDERS, ELECTRODES AND ACCESSORIES

GOING INTO MORE AND MORE CONTRACTORS' EQUIPMENT



DIESEL BRAWN WITHOUT THE BULK

Every day sees more and more General Motors 2-cycle Diesel engines going into contractors' equipment.

The reason is clear. These tough, dependable Diesels provide great power in moderate space and weight. They start easily—pick up their load fast—and run more smoothly.

All because GM Diesels produce power at every piston downstroke. Not a piston loafs through a single revolution.

At the same time, these engines are designed for easier servicing. There's no high-pressure fuel tubing. Injector, pump and metering mechanism are all in a single unit that can be changed in a matter of minutes. When needed, genuine GM replacement parts are always readily obtainable.

Any machine with GM Diesel power is a better machine—sturdy, dependable, economical. So whatever equipment you buy, specify a GM Diesel engine.



GM DIESEL DISTRIBUTORS

All over the country there are competent industrial distributors of GM Diesel engines. They are ready to supply contractors and construction men with equipment powered with GM 71 Diesel engines, with skillful service, and with genuine GM replacement parts.

ALBUQUERQUE, NEW MEXICO The Harry Cornelius Company

ATLANTA, GEORGIA
Blalock Machinery
& Equipment Co.

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LOS ANGELES, CALIFORNIA Anderson-O'Brien Co.

MEMPHIS, TENNESSEE Lewis Diesel Engine Company

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MILWAUKEE, WISCONSIN Drott Tractor Co., Inc.

MISSOULA, MONTANA Mountain Tractor Company

MONTGOMERY, ALABAMA Alabama Machinery & Supply Co.

NEW ORLEANS, LOUISIANA George Engine Company

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Bay Cities Equipment Co.

OKLAHOMA CITY, OKLAHOMA The Diesel Power Company

OMAHA, NEBRASKA Fehrs Tractor & Equipment Co.

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SEATTLE, WASHINGTON Lomen Equipment, Inc. (For Alaska)

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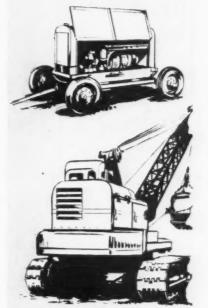
ST. LOUIS, MISSOURI Western Machinery Company

ST. PAUL, MINNESOTA Borchert-Ingersoll, Inc.

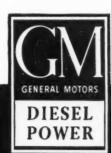
STEUBENVILLE, OHIO Ray C. Call Company

STOCKTON, CALIFORNIA Moore Equipment Company

WILKES-BARRE, PENNSYLVANIA Standard Equipment Co.



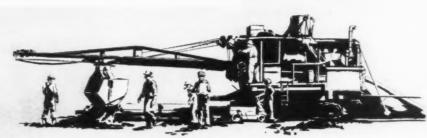


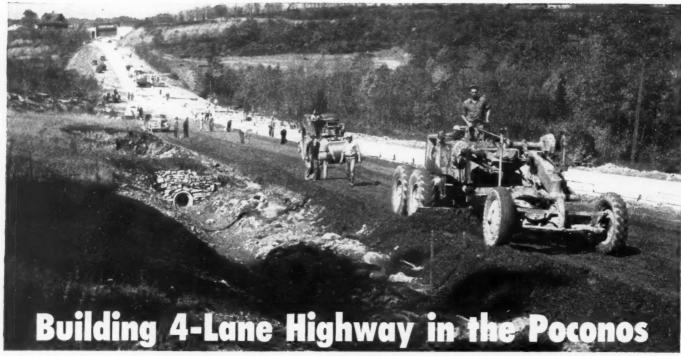


DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH.
SINGLE ENGINES .. Up 10 200 H.P.
MULTIPLE UNITS .. Up 10 800 H.P.
GENERAL MOTORS







Looking north toward Mt. Pocono. Scraper (foreground) smooths road bed. Bethlehem hinged bar mats and road joints are being used in paving operations (background).



Bethlehem reinforcing bars help provide strength for this 166 ft culvert, located near southern end of new road.

C. W. Good, general contractor appears at the left. At the center is M. E. Boogar, district construction engineer, and at the right C. M. Benz, resident engineer, both of the Pennsylvania Department of Highways.

These on-the-job photographs were taken during construction of a 4-lane highway in the Poconos, between Tannersville and Mt. Pocono, Pa. Built to replace a winding, outmoded road, this 5.7-mile stretch of highway is part of U. S. 611—express route from Philadelphia to Scranton and the north.

In addition to more than 139,000 sq yd of pavement, the job includes three bridges, three culverts, one arch, and one arch-extension—all of reinforced-concrete construction. C. W. Good, of Lancaster, Pa., is the general contractor.

Hinged bar mats, bridge reinforcing, road joints, guard rail and posts were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

STEEL FOR HIGHWAYS

Road Joints Reinforcing Bars Bar Mats Guard Rail Guard Rail Posts and Fittings Wire Rope and Strand Hollow Drill Steel Fabricated Structural Steel Sheet and H-Piling Spikes Timber Bridge Hardware Bolts and Nuts Tie-Rods

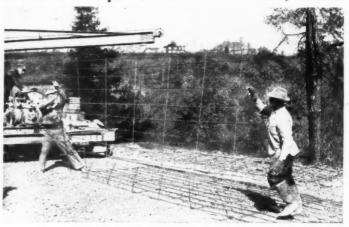






An example of Bethlehem's dependable steel service to contractors . . . Bethlehem hinged bar mats arrive at the job, ready for use.

Below: Bethlehem hinged bar mat goes into place over a 7-in. concrete fill. Note ease with which bar mat is handled by two men.



SPEED and Wheels! ECONOMY on Wheels!

FINGERTIP AIR CONTROLS ONE-MAN OPERATION $_{3/8}$ YD, and $^{1/2}$ YD. SHOVELS 6 to 12 TON CRANES

No waiting — no delays! Out on the job or around the yard MICH-IGAN Mobile CRANE'S time-saving, cost-cutting operating speed. economy and truck mobility pays off on every lifting and excavating job. Long-time MICHIGAN owners will tell you that for crane, clamshell, dragline, trench hoe and shovel work the fully convertible MICHIGAN Mobile SHOVEL-CRANE is truly "speed and economy on wheels"!

Get all the facts - send for Bulletin CM-27



MODEL TLDT-20 CRANE 12-ton capacity. Power lowering as well as lifting. Large heavy duty hoist drum for precision crane work. Timken tandem dual drive axle. Total reduction in low gear 72.88-1. Four Timken-Westinghouse Air Brakes. 30 MPH travel speed



Fleet after fleet is piling up mile on mile of low-cost operation with

Stanolube HD

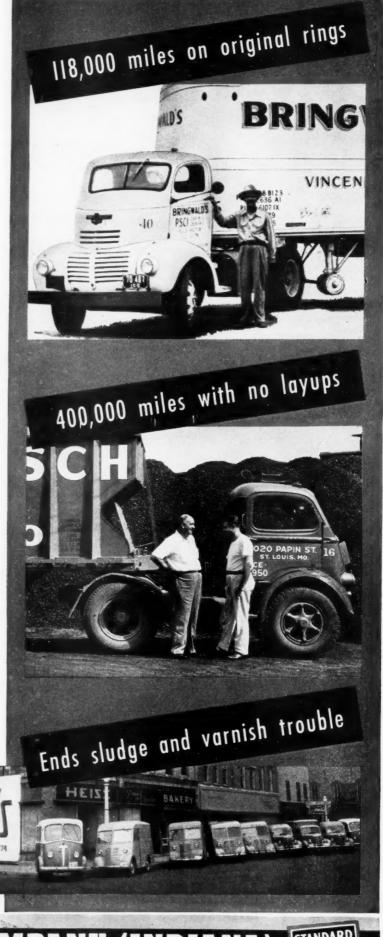
LOOK at some of the records. The 1942 GMC truck-tractor (top, right) was put into operation on Stanolube HD early in 1943 by Bringwald's Transfer, Vincennes, Indiana. Now after 118,000 miles on the original rings the engine still has good compression pressures.

Or take the 25-ton coal truck operated by Wm. Klipsch and Sons Coal Company, St. Louis, Missouri. In well over 400,000 miles of steady, daily driving there has been no time lost due to faulty engine performance.

The Heiss Baking Company fleet at Oshkosh, Wisconsin, (below) was plagued by sludge and varnish trouble until Stanolube HD was recommended by a Standard Oil Automotive Engineer. He reports that repairs were reduced, clogging of oil screens disappeared, and engines stayed clean with positively no ring sticking.

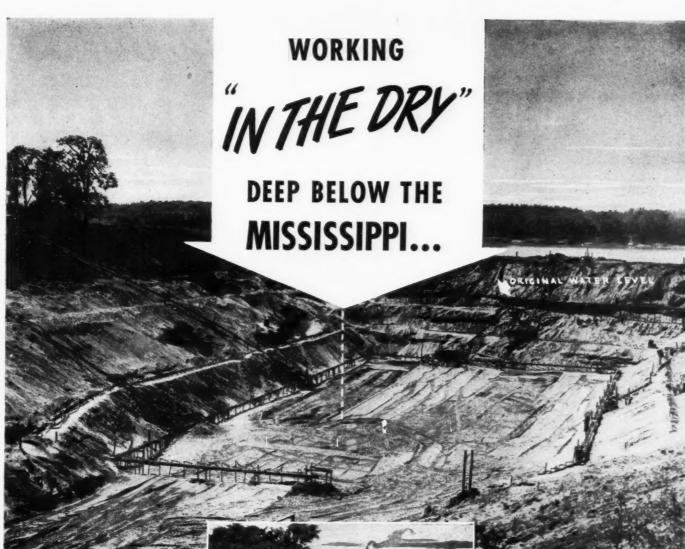
These are not the unusual records—they're typical of fleet performance on Stanolube HD.

You can find out how much this modern heavy-duty motor oil will cut maintenance simply by asking a Standard Oil Automotive Engineer to test it in one of your hard-working trucks. This Engineer also has a Streamlined PM plan to help you get maximum life and power from all units in your fleet. Write Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Ill., for the Engineer nearest you.



STANDARD OIL COMPANY (INDIANA)





Moretrench Pumps and Moretrench Wellpoints control the water with ease on this river diversion project.



With Moretrench
insurance,
construction goes
ahead—on schedule!
\$\$\$ saved!

FOR THE FULL STORY of Moretrench Wellpoints, write for our 100-page catalog with engineering data.

MORETRENCH CORPORATION

90 West St New York

3037 S. Christiana Ave Chicago 23, Illinois 2424 Chicago Ave.

315 W. 25th St.

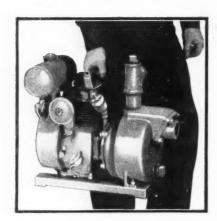
Rockaway New Jersey

Don't GAMBLE! Don't GUESS!





Simplicity is the keynote of all Gorman-Rupp pumps. The Gorman-Rupp Heavy Duty Pumps are big, tough and dependable. The pump pictured above is the model 1602 (formerly model 90-M) with a capacity of 1500 gallons per minute at average total head.



The Gorman-Rupp "Midget" pictured here, the smallest of the lightweights, weighs only 60 pounds and is easily carried by one man. It will pump 3000 GPH at ordinary heads.

It won't cost you a cent to learn what pump will do the best job for you. Ask your distributor for the Gorman-Rupp pump that will best suit your requirements. Put it on the job and if it does not out-perform any other for size of pump, for power consumed and for dollar of investment, return it at our expense.

Do you need a pump as small and easy to carry as a bag of tools -- that will deliver 3000 gallons per hour? Or do you have a heavy dewatering job that calls for as much as 125.000 gallons per hour of continuous operation? What ever the application or size required, there is a rugged Gorman-Rupp self-priming centrifugal pump that will do the job better than any other pump you have seen.

For further information call your nearest distributor or write us for Bulletins.



MAN-RUPP COMPANY

BOWMAN STREET . MANSFIELD, OHIO

INDEPENDENT ROPE SHOVEL CROWD

2 CRAWLER SPEEDS (STANDARD)

UNIT ASSEMBLY— EASIER SERVICE but but so was the Atomic Bomb!

ELECTRIC DIPPER TRIP

INTERCHANGEABLE PARTS

ALL-PURPOSE CRANE BOOM

5 IDENTICAL CLUTCHES

LIGHTS (STANDARD EQUIPMENT)

"FULL CIRCLE"
CRAWLER STEERING

DROP-FORGED CRAWLER TREADS

ANTI-FRICTION BEARINGS

OIL-ENCLOSED CRAWLER PROPELLING MECHANISM

STARTER AND GENERATOR (STANDARD)

9 RUBBER-TIRE
MOUNTINGS AVAILABLE

• It takes "know how" to pack a lot of action and quality into a small package. The TL-20 offers features in turntable, mountings and boom equipment that bring new life, action and profits to shovels and cranes in the ½ yd. class.

Check the features above, then see your local Thew-Lorain distributor for an early demonstration of the TL-20—the year's biggest small machine value.

THE THEW SHOVEL COMPANY . LORAIN, OHIO

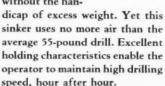
Lorain 20

when you need "SECOND WIND"

Equipment that slows down or quits when the going gets too tough won't do for long-pull jobs. The
Gardner-Denver equipment shown on this page has
its "second wind" built in. It has the extra capacity
to keep going . . . at high efficiency . . . regardless
of ground or weather. For complete information,
write Gardner-Denver Company, Quincy, Illinois.

Broiling heat or bitter cold won't affect the performance of Gardner-Denver Portable Compressors. That's because their cylinders are completely water jacketed for sustained high efficiency, regardless of temperature or altitude. Complete water cooling, too, means less lubricating oil consumption.

With its 67 pounds of speed and power, this Gardner-Denver S73 has the capacity to drill faster in harder ground and to drill deeper holes without the han-





With its combination radiator and air-cooled intercooler, this Gardner-Denver "WB" Compressor is ideal where water is scarce or of poor quality. Evaporation of the cooling water is practically nil, so that water seldom needs to be added. Note the compact design.



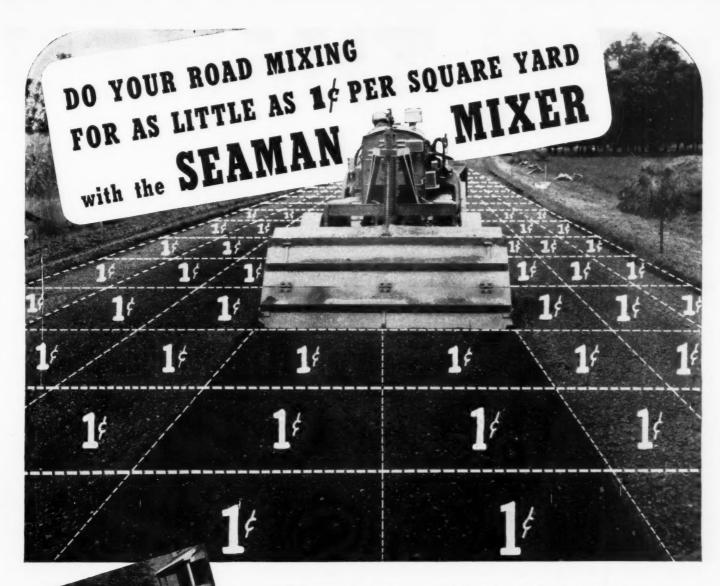
GARDNER-DENVER

SINCE 1859



A full six-foot change, with something extra for odd steel changes, is readily handled by the Gardner-Denver UM99 Wagon Drill. Vertical holes can be drilled down to a rock face or at any angle with the fully adjustable U-bar of the UM99. The D99D drill blows deep holes efficiently.





Pocket size but packed with useful, practical facts,—the ever-popular "Soil Stabilization Methods,"—a book compiled by Seaman engineers. Yours on request.

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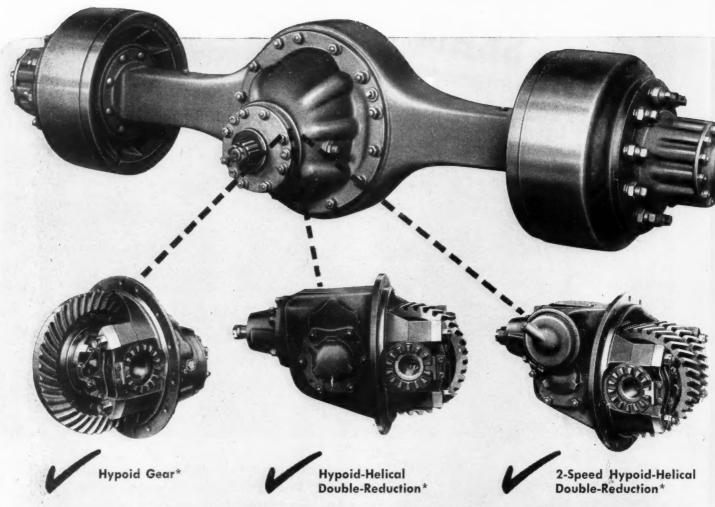
While costs of operating any mixing equipment vary according to the character of mixed materials, local labor rates and several other factors,—nevertheless, under reasonable conditions, careful cost analyses have repeatedly shown that the motorized SEAMAN MIXER-Model MHD-72, produces a thorough, uniform and intimate mix for as low a cost as one cent per square yard. Even under adverse conditions costs generally do not exceed 5 cents . And with the SEAMAN MIXER, low-operating cost is coupled with high daily output. One Model MHD-72, operating in conjunction with a motor patrol, will mix 100 tons an hour,—or operating with a 100 ton conventional travel plant, will double that capacity. Calculated on the basis of square yards,—the SEAMAN MIXER can be counted on for 5000 square yards in an eight hour day, in fact, under good operating conditions, Model MHD-72's have repeatedly turned out over 9000 square yards in 8 hours . . . What's more, - SEAMAN MIXERS represent a surprisingly small investment. Prices start as low as \$869.00 F.O.B. Milwaukee.



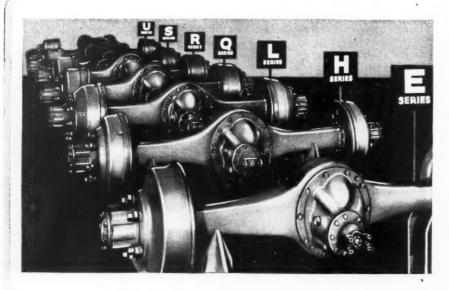
SEAMAN MOTORS, INC.

305 NORTH 25th STREET

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*INTERCHANGEABLE IN SAME AXLE HOUSING USING THE SAME AXLE SHAFTS



- 1 Seven new related series of axles, providing a complete range of capacities for all medium, light-heavy and heavy-duty requirements.
- 2 Three optional types of final drive in each capacity, each interchangeable in the same axle housing using the same axle shafts.
- 3 A wide range of optional final drive gear ratios.
- 4 New Advanced-Related Design, with exclusive Timken Hypoid "Hy-Performance" Gearing throughout the entire line.

3 for AXLES!

THE FINAL ANSWER TO FINAL DRIVE PROBLEMS!

The new Timken postwar line of "3 for 1" Axles with exclusive Timken Hypoid "Hy-Performance" Gearing supplies the final answer to the problem of fitting the truck to the job—with the right axle—with the right type of final drive.

How Does It Solve This Problem? It is a complete line of new axles in a complete range of seven series or capacities—for medium, light-heavy and heavyduty vehicles.

You have a choice of three types of final drive in each capacity axle—Hypoid—Hypoid-Helical Double-Reduction—or Two-Speed Hypoid-Helical Double-Reduction with Easy Power Shift.

Each of these three types of final drive is interchangeable in the same axle housing using the same axle shafts.

You have a choice of gear ratios in each type of final drive.

New Timken Hypoid "Hy-Performance" Gearing and other postwar features of design make it the most modern line of axles in the motor transportation industry.

Act Now-Ask About Axles!

It will pay you to get all the facts today! See the dealer who sells Timken Axleequipped trucks—then specify new Timken "3 for 1" Axles under the next new trucks you buy.

THE TIMKEN-DETRO!T AXLE COMPANY

DETROIT 32, MICHIGAN

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TIMKEN AXLE BRAKE DIVISION, DETROIT, MICHIGAN

Timken offers, for the first time, the full advantages of Hypoid Gearing in all three types of final drive in seven different capacities. You get a wider range of gear ratios . . . increased torque capacity . . . sturdier gear mounting . . . longer life . . . and increased dependability.

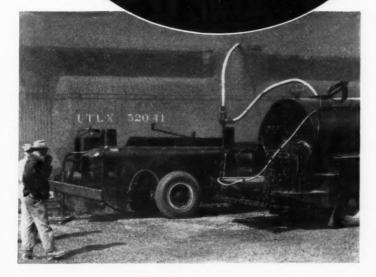
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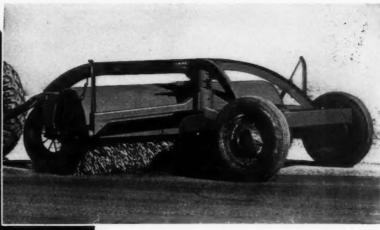
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PNEUMATIC ROLLERS

Grace Pneumatic Rollers are engineered to keep the load close to the ground, eliminating tipping. Made with 10 tires, oscillating axles, large body and plenty of ballast room.



Other Grace Equipment Built on Engineering Principles Include Sheepsfoot Rollers, 600-Gal. Maintenance Kettle, Drag Brooms and Concrete Carts

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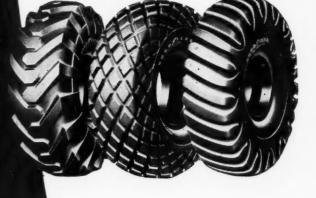
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THE RIGHT TIRE FOR EVERY JOB

SURE-GRIP for maximum traction on drive wheels ALL-WEATHER EARTH-MOVER for drawn vehicles and general traction HARD ROCK LUG for super stamina in all rock work



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GOODFYEAR

OFF-THE-ROAD TIRES

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Construction Methods

FEBRUARY 1947

STATE HIGHWAY PROGRAM

1946

 Hard Surface
 2,900 mi.

 Bituminous
 17,000 mi.

 Stabilized Soil
 2,500 mi.

 Graded
 5,300 mi.

 New Construction
 \$750,000,000

 Maintenance
 \$297,000,000

1947 ESTIMATES

New Construction \$1,100,000,000 Maintenance \$350,000,000

ANNUAL ROAD BUILDERS' NUMBER

Dual-Dual HIGHWAY BUILT UNDER HEAVY TRAFFIC



DUAL-DUAL SECTION of New Jersey's Route 25 has four roadways each with two-lane, 24-ft. concrete pavement and 8or 10-ft. bituminous concrete paved macadam shoulder. Outer roadways are for local traffic, inner ones for fast through traffic. Looking north, before completion of curbs, shoulders or center island, view shows southbound traffic temporarily routed over northbound expressway.

SUBGRADE PLANE (below), job-built by S. J. Groves & Sons Co., may be adjusted to correct grade by turnbuckle on levered wheel support. When in use, hand pulled rig rides on road forms or adjacent slabs.



TRAFFIC COMPLICATES most roadbuilding jobs, and when the project is the modernization of one of the world's most heavily traveled highways on which four lines of traffic must be maintained at all times in spite of conflicting alignments of the old and new roads, it means plenty of short paving runs and many equipment moves. Such were the conditions under which a stretch of New Jersey's Route 25 (U. S. Route 1) between Newark and Elizabeth was rebuilt into an eight-lane dual-dual highway from a four-lane road at a cost of nearly \$1,000,000 a mile. Although the roadbuilding project covered the comparatively short distance of only 3.3 mi. it involved more than 250,000 sq. yd. of paving and was bid in four sections to promote competition and speed completion. Three firms, Robert W. Cleveland & Co., Poirier & McLane Corp. and S. J. Groves & Sons Co., operating independently, were the successful bidders.

The spectacular dual-dual superhighway has a total paved width of 132 ft. including shoulders, and is in reality four separate roadways set side by side. The two outside roads, which are for local or slow

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traffic, are each 34 ft. wide with one 13-ft. and one 11-ft. concrete lane and a 10-ft. paved shoulder. The two center roads are 32-ft. expressways for fast, through traffic and are similar to the outside roadways except that shoulders are only 8 ft. wide. Pavement is a 10-in. reinforced, air-entrained concrete slab on a 12-in. sand or cinder sub-base, while shoulders are a 1-in. bituminous concrete surfacing on top of a 7-in, macadam foundation on a 14-in. sub-base. Reflecting curbs 2 ft. wide separate local from through traffic, while a grassed center island separates vehicles traveling in opposite directions. Suitable acceleration and deceleration lanes at various points permit traffic to move between fast and slow roadways and to enter or leave the highway at junctions with intersecting roads. There are no crossings at grade throughout the route's reconstructed length and five overpass bridges were included in the paving contracts.

Some Fill Previously Placed

In general, the highway follows the previously existing route traversing swampy ground with the water table only 6 to 8 ft. below slab surface. A few years ago, in anticipation of the present modernization, the muck alongside the old roadway was excavated and backfilled with bank run gravel to make a minimum 186-ft. right of way, which was sufficient for the new highway's 168-ft. width between outside curbs.

Because of changes in profile and because the new alignment crosses and recrosses old lanes of both asphalt and concrete paving, the existing pavement could not be incorporated into the new highway. Also, settlements in the asphaltic concrete pavement had been patched by additional asphalt layers and it was feared that this non-uniform support might cause cracking of the new slabs. Consequently, the old pavements were broken by rippers and power shovels and removed. Bulldozers and carrying scrapers did the necessary clearing and earth excavation, which was all shallow cut work, and 10-ton rollers compacted the subgrade for the sub-base.

Generally, a 12-in. sub-base of clean dredged sand with a silt content of less than 2 percent was spread in two 6-in. layers and consolidated to 97 percent of maximum density by ten passes of a 14-ton tractor.



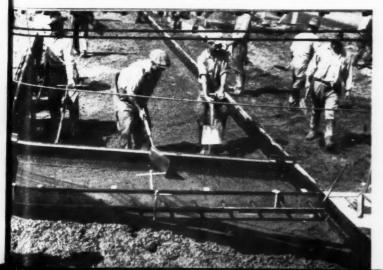
WOOD SCREED weighted with steel road form trims dredged sand sub-base. Note strip bolted to far slab form to box out for longitudinal joint keyway.



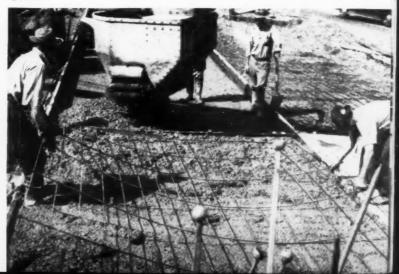
DRY SUBGRADE is sprinkled before slab is poured. Concrete is Class B mix with 2- to $2\frac{1}{4}$ -in. slump and entrained air content of 3 to 6 percent.

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DOWELED EXPANSION JOINT (below) with ¾-in. cork filler is supported at ends by clips on form and previously cast slab, and at center by special lipped pin. Note Robert W. Cleveland & Co's job-built steel scraper leveling subgrade.



REINFORCING MAT (below), of %-in. bars tied in 7½x27-in. mesh is placed on 8-in. pour before final 2 in. of 10-in. slab is spread.





ALL CONTRACTORS MIXED in Ransome 34-E dual-drum pavers. This is Groves' contract where Master vibrator moves concrete ahead of hand tamper while Blaw-Knox finisher waits for concrete to be dumped on embedded reinforcing.



PREASSEMBLED JOINT on Poirier & McLane Co.'s contract is positioned on subgrade. Dowels are 1½x18-in. rods on 12-in. centers with one end painted and sleeved in sheet metal.



TONGUE-AND-GROOVE expansion joint with steel plate and wood filler transfers load where joint is not normal or radial to both sides of slab. Here joint is pinned to cinder sub-base on Groves' section.

On one section, an existing water-bound macadam base and cinder sub-base was used, augmented by additional sand, while on another section a rolled cinder sub-base was placed despite the fact that during compaction the cinders lost up to 40 percent of their original loose volume. After sub-base consolidation and setting steel road forms, the subgrade was dressed, mainly by hand tools although there was one mechanical subgrader on the job.

Concrete Slab Construction

On the prepared subgrade a 10-in. air-entrained concrete slab 11 or 13 ft. wide was poured. The slabs, with doweled transverse joints on 56-ft. centers and with a cast, keyway-type longitudinal joint, were reinforced with tied or welded steel embedded 2 in. from the top. Tied mats were \%-in. deformed bars in a 7½ x 27-in. mesh, and welded mats were \%-in. longitudinals on 6-in. centers spaced by ¼-in. rods 12 in. apart.

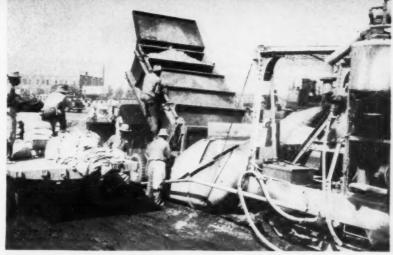
Paving concrete, a 1:1.71:3.50 Class B mix with 4.4 gal. of water per bag, had a 2- to 2½-in. slump and an entrained air content of 3 to 6 percent. Mixed 1¾ min. in 34-E dual drum pavers overloaded 10 percent, a 9-bag batch of concrete was produced every 62 sec.—or on a cycle of about 2 min. from skip to subgrade. Each 9-bag batch contained 1,546 lb. of 1½-in. stone, 1,544 lb. of ¾-in. stone, 1,463 lb. of sand and 39½ gal. of



TOP LAYER OF CONCRETE is dumped (below) ahead of Cleveland's Jaeger-Lakewood finisher as Jackson vibrator consolidates mix along tarred longitudinal joint with

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February 1947





BATCH TRUCKS DELIVER AGGREGATE for more than 200,000 sq. yd. of 10-in. pavement on 3.3-mi. superhighway project. Poirier & McLane's trucks (left) carry batched cement in bulk containers, while Cleveland adds bagged cement by hand (right).

water. Cement, with air-entraining agent added at the mill, figured 6.7 bags per cu. yd. or 1.86 bags per sq. yd. of 10-in. pavement. One contractor used bagged cement added at the skip, while the others mounted bulk cement containers on the trucks delivering batched aggregate to the pavers.

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Paving proceeded one lane at a time. Concrete was seldom mechanically spread because of the limited length of paving runs, but careful control of paver bucket and internal vibration of the dumped concrete kept even hand spreading to a minimum. With a hand struck and tamped 8-in. depth of concrete on the subgrade, reinforcing mats were laid and 2 in. of concrete placed on top. Mechanical screeding and finishing was followed by hand floating, belting, brooming and edge tooling. The surface was sealed with colorless curing compound and kept

closed to traffic for at least 12 days. On one short section of the job, where speed in opening the stretch was essential, high-early-strength cement and doubled reinforcing permitted travel only four days after pouring. Operating only one paver apiece, each of two of the contractors laid a normal



SAFETY REFLECTING CURB is faced with white concrete. Vertical curb (left) is poured against cast metal form, while sloping curb (right) is shaped by toothed scoring tool. Curbing on 3.3-mi. dual-dual highway job totals 23 mi. and is subcontracted to Frapaul Construction Co., Inc., Hackensack, N. J.

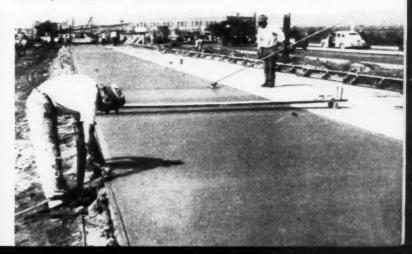


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HAND SCREEDING (below) and finishing of short, odd-width slabs is slow, backbreaking work compared to smooth, speedy machine finishing. It takes six men to move this steel channel screed through stiff mix.



SLAB IS BROOMED (below) and edges are rounded and tooled after floated surface is belted with light strip of burlap. Note carrying handle on end of plank bridge for removing wood spacer from top of expansion joint later sealed with poured asphalt.



daily average of more than 1,100 sq. yd. of 10-in. pavement.

Shoulder construction followed concreting of slabs and curbs. On a 14-in. compacted sub-base, a 4-in. waterbound macadam base of 21/2-in. size stone was spread by trucks and patrol graders and was thoroughly rolled, after which a 3-in. modified penetration macadam intermediate course of 11/2in. size stone was placed. After rolling, the stone was penetrated with 1.7 gal. per sq. yd. of hot asphalt (OA-4) and was keyed and re-rolled. Shoulders were surfaced with a 1-in. layer of coldmixed asphaltic concrete that was machine spread, rolled and sanded.

Except for some overpass work, which was held up by slow deliveries of structural steel, construction of the 3.3-mi, section of dual-dual superhighway was completed in December, 7 months after four contracts totaling \$3,173,000 were let as follows: To Robert W. Cleveland & Co., East Orange, N. J., Contract 1 for .85 mi. at \$552,000 and Contract 3 for .71 mi. at \$373,000; to Poirier & McLane Corp., New York, Contract 2 for .68 mi. and four overpass bridges at \$1,254,000; and to S. J. Groves & Sons. Co., Woodbridge, N. J., Contract 4 for 1.06 mi. and one overpass at \$994,000. Project managers and superintendents, respectively were: Royal E. Cleveland and Manuel Texeira for Cleveland; Bert J. Jordan and James P. Jordan for Poirier & McLane, and J. B. Mathews and J. Valone for Groves. With the exception of Contract 1, which was wholly state financed, the highway was built under the Federal Aid Program of the Public Roads Administration. For the New Jersey Highway Department, Spencer Miller, Jr., is commissioner, Charles M. Noble is highway engineer and R. M. Beck is district construction engineer. Maurice Radus, David Pettigrew, William Kays and A. A. Paul were the state's resident engineers on the project.



DOLLY MOUNTED SPRAY OUTFIT seals slab with TMC curing compound applied at rate of ½ gal. per sq. yd. Material is atomized at long-handled nozzle by air from gasoline driven compressor.



BITUMINOUS CONCRETE is hand spread on narrowing 9-in. concrete slab dividing normal traffic lanes from deceleration laneleading from through to local roadway.

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SUBGRADE FOR MACADAM foundation of shoulder is compacted (below) by Tu-Ton roller supplemented by hand tamping along curb and around manholes and inlets.



SHOULDER IS PAVED (below) with 1 in. of bituminous concrete on top of modified penetration macadam intermediate course. Adnun paver spreads cold-mixed material.





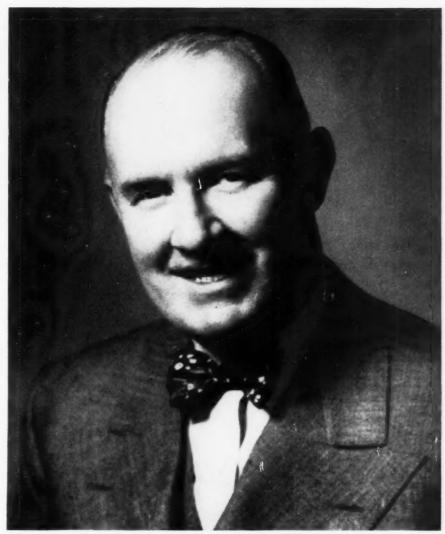
AS A SMALL BOY Tom Callaway visited an earthmoving job in west Texas in the company of his contractor grandfather. Those were the days of the one-man slip scraper powered by one mule in the flesh. "It seemed to me," recalls Tom, "that the mules and the men were sweating desperately and I somehow felt that there must be a simpler way to do all that work."

Long associated with the equipment end of construction, Tom has spent most of his career in helping make construction operations more simple. For the last 18 months he has increased his efforts as president of the Manufacturers Division of the American Road Builders Association. He will carry on during the coming year as the newly-elected president of A.R.B.A., taking office at the annual convention in Chicago this month.

Official documents carry his name as J. T. Callaway, but no one ever bothered to find out what "J. T." stands for. To everyone he is simply Tom.

Tom Callaway was born 54 years ago at Temple, Texas. "It seems," he declares, "that I was born lazy but cursed with claustrophobia, which keeps me moving in spite of myself." His self-analysis of laziness is doubted by those who work with him, for actually he is full of drive and energy.

Tom's desire to wander beyond the haze-free horizons of the Texas prairies was temporarily satisfied in 1911 when he and a pal went to St. Louis to drive a car back to Temple. They had a tough time, finally giving up at Clements, Kan., by dragging the car to a rail-



TOM CALLAWAY

road station with four mules for shipment home by rail. It was then that Tom became impressed by the fact that automobiles might be mechanical marvels, but they were useless without roads. From that day to this he has been an ardent promoter of good roads and still asks, "Should an inadequate highway system be allowed to retard automotive practice?"

Following a year at Baylor and three years at Texas University, where he studied law, Tom was caught by World War I, returning in 1918 as a captain. That same year he joined Goodyear Tire & Rubber Co., and has remained with this company ever since, currently holding the vague title of assistant to the vice-president with headquarters in Chicago.

In 1920 he sold the first dirigible

for commercial purposes, but realizing a slim future in airship sales, he turned to tires. For more than two decades he has promoted the use of rubber on automotive and construction equipment. He has seen, partly due to his efforts, construction machinery take to rubber tires.

From June, 1944, to March, 1945, Callaway traveled back and forth across the country presenting a plan for post-war construction. He outlined in graphic form possible work in highways, railroads, airports, strip mining, logging, reclamation and flood control.

Big, jovial Tom Callaway is a leader, philosopher, salesman and promoter, all in one. As such, he is making his mark in the construction world, and construction is better because of him.

YOUGHIOGHENY RIVER is shallow stream at bridge site, so cranes and trucks can ford it easily. Here is Koehring crane setting steel forms from spot in mid-river. Note steel cap and top beam forms in place on pier in back-

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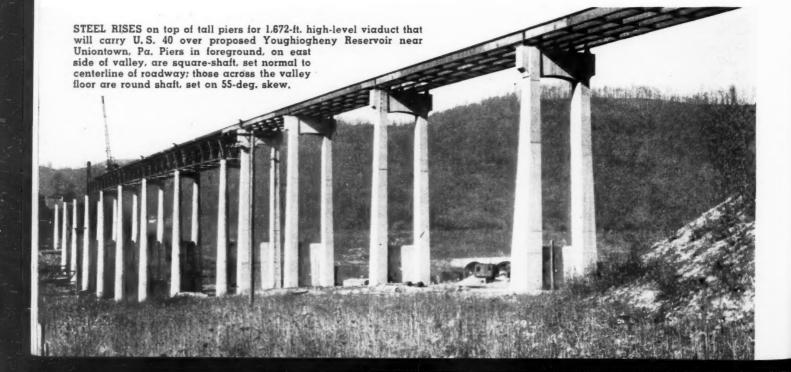
Simple Equipment Builds High Bridge

TWO CRAWLER CRANES, a paver and a gin pole were the only major pieces of equipment used by Cayuga Construction Corp., New York, to build the high concrete piers and erect steel in truss and girder spans for the new high-level viaduct to carry U. S. Route 40 across the proposed Youghiogheny Reservoir east of Uniontown, Pa. Bill Hoffman, veteran New York steel erector, worked with Cayuga in setting the superstructure.

The viaduct, 1,672 ft. long, consists of two abutments and 14 piers that rise as high as 135 ft. above the valley floor. Nine of the spans are 125-ft. deck trusses. The remaining six spans are deck girders from 50 to 98 ft. long. A 31-ft. concrete deck,



SUPERVISING the Youghiogheny Reservoir viaduct for Cayuga Construction Corp. are IRVING TROEMEL (left), project manager and GEORGE SCHUSTER, superintendent.



including a 24-ft. roadway, with concrete rails surmounts the steelwork. Except for one abutment, all foundations are spread footings.

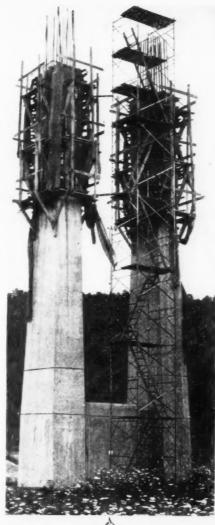
All piers are concrete double shafts rising from a common foundation, tied at the bottom with a 2-ft. web wall and at the top with a cap and arched beam. Shafts of the six main piers across the valley and of the one on the west bank are tapered circular sections, battered % in. per ft. from a top diameter of 41/2 ft. Pin shafts rise from 69 to 135 ft. above foundation, lower web walls are from 14 to 80 ft. high. These seven piers are on a 55-deg, skew with centerline of roadway.

The five piers on the east bank, carrying the plate girder spans, are of similar design except they are square with the roadway and the shafts are rectangular. Inside faces of these shafts are vertical, the other faces are battered 1/4 in. per ft. for four piers, 3/8 in. per ft. for one pier. These piers are 65 to 137 ft. high above foundation.

Bridge Started Before War

Contract for the bridge was let to another firm just before the war, but the contract was rescinded and work shut down after the foundations had been poured for the seven round-shaft piers and the piers and web walls were up about 40 ft. Cayuga was low bidder when work was resumed last year.

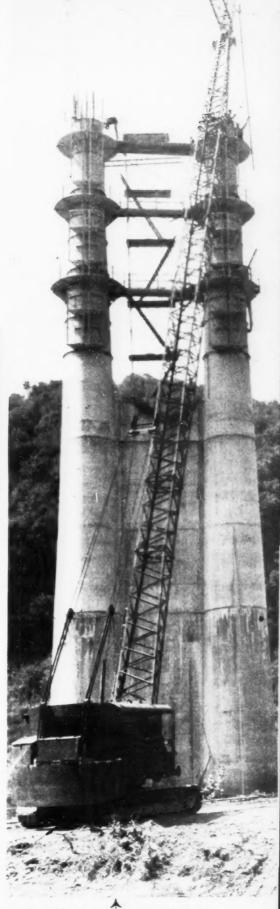
Because of the varying batter on the square-shaft piers, ordinary wood forms had to be used, completely wrecked and rebuilt for



BECAUSE OF VARYING BATTER, wood forms had to be used on square-shaft piers, forms being completely wrecked and rebuilt for each pier. Pipe scaffold tower, equipped with ladders and working platforms, is built up alongside each pier for access to forms.

SAFETY was one of features of Atlas steel forms (below) for round-shaft piers. for each 14-ft. section came equipped with walkways and ladders. Web walls are made up of sectional steel forms welded into single panel. Here crane with insley bucket dumps concrete into form.





STEEL FORMS for 135-ft. round-shaft piers are set by Manitowoc crane with 150-ft. boom. Reinforcing and concrete are also handled by this crane, fitted with extra 15-ton concrete counterweight. Only one complete set of forms is required for seven piers: as lower forms are released they are moved ahead to next pier.

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ONLY PILE FOUNDATIONS on entire bridge are under east abutment. Koehring crane, fitted with steel leads, drives steel pipe piles through hard ground. Hammer banged away for hours on some piles to get them down to specified depth.

each pier. However, on the roundshaft piers steel forms could be used to good advantage.

Atlas Steel Construction Co., Irvington, N. Y., designed and furnished an excellent set of steel forms for the job. Forms for one complete pier, made up in seven sections, were supplied along with two extra bottoms for the top cross-beams. The lower three sections included panels for the web walls, made up of 14-ga. Atlas Speedforms welded into single side panels. Form sections were 14 ft. high, with cross-bracing and working platforms at each joint. Forms were altered for the last pier poured to accommodate a gage well in one shaft.

Construction Procedure

Construction operations were amazingly simple. A 1-yd. Ransom paver was moved from pier to pier to discharge direct into a 1-yd. Insley bucket. A Koehring crane with a 100-ft. boom and a Manitowoc crane with a 150-ft. boom set all forms, handled reinforcing and lifted the concrete buckets to the forms. An extra counterweight of 15 tons of concrete was added to the Manitowoc crane. The river here is small, and could be forded at all times by trucks and the cranes.

Concrete, of slag aggregate and air-entraining cement, was proportioned in a batch plant, and batches were trucked to the paver. Two sections of forms, or 28 ft. of pier, were poured together, and then the top form section was left in place to carry the next two sections. By staggering the pours on the piers, a double-section of forms was always ready for concrete. A Chesebro-Whitman steel pipe tower, equipped with ladders, was erected alongside each pier for access to forms.

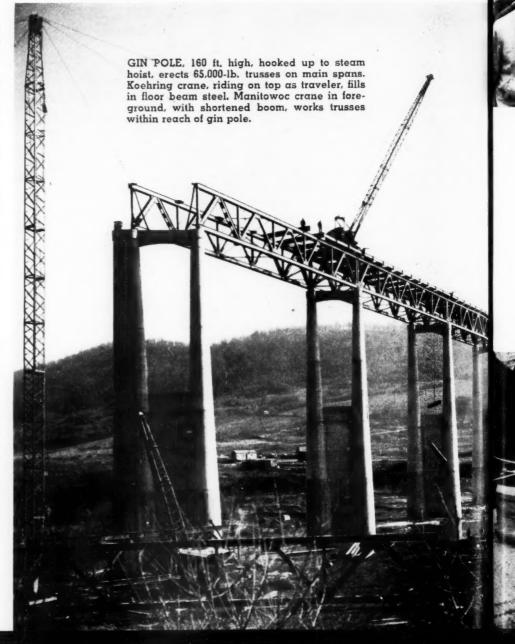
Steel erection was just as simple. Hoffman set the plate girder spans first, starting at the east abutment. The first span was placed from on top by the Koehring crane; the remaining girders were lifted to place from below by the Manitowoc, while the Koehring, working as a traveler, filled in the floorbeam steel from deck

level and moved across the span.

For erecting the trusses, which were fabricated on the valley floor, an extra crane boom was set up as a 160-ft. gin pole midpoint between piers, hooked up to a steam hoist. The 65,000-lb. trusses were lifted to bridge seat level by this rig, assisted by the Manitowoc crane. Floor beams were filled in by the Koehring crane, which continued working across the bridge.

The concrete deck will be poured this spring as soon as weather permits.

Irving Troemel is project manager on the job for Cayuga Construction Corp., and George Schuster is superintendent. Bill Hoffman supervised the steel erection. The project is jointly sponsored by the Corps of Engineers, Pittsburgh District, and the State Highway Dept. of Pennsylvania. A. R. Lewis is resident engineer for the state.



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Step 54 FIELD METHODS

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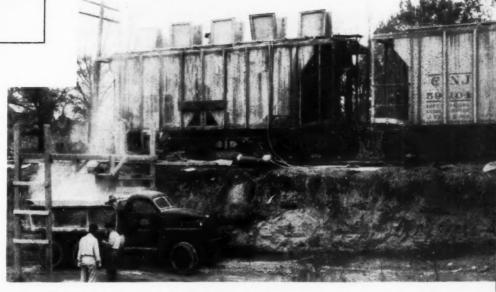
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Special Equipment Builds SOIL-CEMENT ROADS



THESE TWO are revolutionizing soil-cement road construction in North Carolina. DICK BEAN (left) is superintendent for Nello L. Teer Co. ARNOLD DAVIS, head of Teer's asphalt division, worked out equipment details and construction procedure.

2 CEMENT SPREADER built by Teer is two-wheel trailer with 7-ft. distributing belt that travels at same speed as trailer. Two adjustable screeds regulate spread of cement. Here loaded truck is backing up to hook on to spreader through special coupling.



BULK CEMENT is unloaded directly from hopper cars into 40-bbl. dump trucks by screw conveyor. Truck bodies are covered with canvas held in position by coil springs for trip to job.

SOIL-CEMENT STABILIZATION has been more or less of a hap-hazard operation, but Nello L. Teer Co., Durham, N. C., contractors, have made it a scientific construction procedure on several farm-to-market projects in North Carolina. Teer turned the job over to Arnold Davis, manager of his asphalt division, and for a man

raised on blacktop, Davis has done wonders with cement. Key to the operations is the big P&H "Single-Pass" stabilizer, which mixes the soil in place with cement and water, pulverizes the mixture and spreads it in an even layer behind the self-propelled machine.

Bugbear of soil-cement work has been the distribution and spreading of cement. Usual practice is to spot paper bags of cement at regular intervals, break open the bags with a spade, and spread the cement with a rake. The Teer company considered such procedure unsatisfactory and a nuisance, and besides, they wanted to use bulk cement. No suitable cement spreaders are on the market, the P&H machine is equipped to disperse asphalt, but not cement, so they built a home-made spreader that works like a charm.

The spreader, pulled by the cement dump truck that transfers its



Page 9



BULK CE-MENT is transferred from dump truck to spreader as two units move slowly ahead. Two men with hoes pull cement hopper. spreader Because spreader belt travels at same speed as trailer, uniform layer of cement is spread regardless of travel speed of the truck.

load the same as for a conventional sand spreader, is a trailer mounted on two steel wheels. The wheels drive a belt 7 ft. wide that travels at the same speed as the trailer, so the cement drops off the belt on to the road without flying. Cement dumps from the truck into a hopper on the spreader, and its flow from hopper to the road over the belt is controlled by two adjustable strike-off plates.

Teer has had several contracts for 21-ft. low-cost farm-to-market roads in central North Carolina. His grading outfits do the necessary grading in advance, then the stabilizing crew moves in and with only cement added to whatever material is available at the top of the grade, turns out an excellent stabilized base at a rate as high as 4,000 ft. of full-width road per day. Specifications call for a 70-lb. (3/4-in.) double surface treatment with asphalt. Teer has substituted a better surface, with permission of the highway department of course, consisting of a 100-lb. (1-in.) hot plant mix. The resulting road is about tops for highways of this class.

There is far more to the operations than just spreading and



4 KEY TO OPERATIONS is P&H "Single-Pass" stabilizer, a self-propelled machine adjusted to cut 6-in. into top of grade, mixing soil with cement, spread in advance, and water, and depositing mixture in an even layer behind machine. Here stabilizing unit is in raised position to move machine into operating position on road. Stabilizer consists of four revolving drums: at left, nearest power unit, is cutter drum that digs soil loose in 6-in. cut 8 ft. 3 in. wide: next is blending drum that throws loosened material back into pulverizing area, where two pugmills at right thoroughly mix cement and soil with water which is added through spray bars as material passes to pugmills.

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5 AT WORK ON ROAD, stabilizer (below) pushes 1.500-gal. water truck, connected to machine by flexible hose. Centrifugal pump on stabilizer delivers water to pugmill at metered rate. Stabilizer travels from 6 to 28 ft. per min., depending upon hardness of soil and depth of cut. It was designed for asphalt stabilization and is equipped with asphalt pumps and meters, but it works equally well on soil-cement operations.

FOLLOWING MIXING BY STABILIZER, soil is shaped up to road contour by Caterpillar grader (below) whose small front wheels have been replaced with larger tires, same size as on rear, to produce uniform wheel loads. Scarifier on grader loosens up any compaction due to local traffic before road is shaped up.





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10 tuted treat mixing the cement. To give the complete picture, the procedure will be described step-by-step, as shown in the accompanying photographs taken on a Durham County job.

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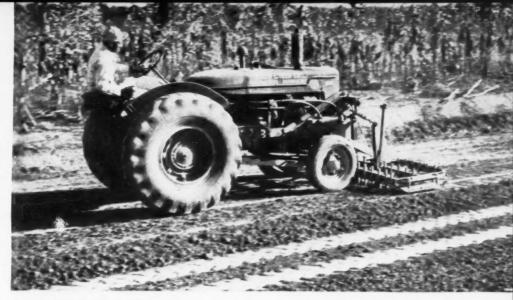
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Bulk cement is delivered in hopper cars to a spur in Chapel Hill, where the railroad fill permits direct unloading into trucks. The trucks are open body 6x6 Studebaker dump-type, obtained from war surplus, carrying 40 bbl. per trip. They are covered with a tarp to prevent loss from wind and rain. Cement dumps into a hopper below the cars and is carried out over the truck body by a screw conveyor, where it discharges through a canvas spout.

Upon reaching the job, the trucks, one at a time, are hitched



T WORKING WITH GRADER in shaping up road is special harrow, mounted on front end of International wheel tractor through hydraulic-controlled frame that regulates depth of scratching. Final operation in harrowing is to drag harrow backwards to leave top surface loosened for subsequent rolling.



8 FIRST ROLLING of shaped surface is by special sheepsfoot roller mounted on International TD18 tractor through bull-dozer frame so roller can be lifted for travel. Feet of roller, modified by Teer, are square so unit can operate in either direction. Mixed surface is given thorough compaction with this roller. Road is dampened by truck sprinkler during operations if necessary.

to the spreader. The dump body is raised as the truck and spreader move forward. Two men ride the spreader to pull the cement into the hopper with hoes. The stabilizing machine can cut to 9 in., but for soil-cement work it is adjusted to cut 6 in. deep, and the screeds on the spreader are set to deliver cement at the rate of from 10 to 16 percent of the volume of soil to be mixed, the exact amount depending upon the type of soil. The amount of cement being spread is checked by passing the spreader over a 3x3-ft. canvas (1 sq. yd.) and weighing the amount laid on the canvas. Three passes of the spreader are required for treating the full 21-ft. width of road, and cement is usually laid in 500-ft.

When the cement is spread over a 500-ft. length of road, the P&H stabilizer moves in. This is a selfpropelled rig, mounted on crawl-(Continued on page 184)



9 FINAL COMPACTION is with this pneumatic roller, pulled by International wheel tractor. Roller box carries sand ballast and also job tool box. From 6 to 8 hr. after surface is compacted smooth by this roller, grader clips surface, casting cuttings aside, and final treatment of grade is drag brooming and another pass with pneumatic roller. After 7-day curing period, road is ready for surfacing.

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FINAL SURFACING is 1-in. hot plant mix applied by Barber-Greene asphalt paver (below). Contractor substituted better hot plant mix in place of specified double-surface treatment at no extra cost to state.



FINAL RESULT is smooth, well-built low-cost road (below) that compares favorably with many higher types. North Carolina is building hundreds of miles of farm-to-market roads such as this one in Durham County.





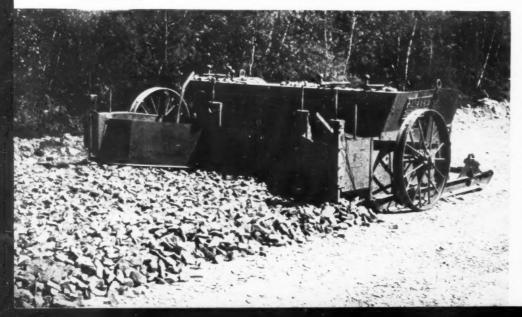


BASE OR BOTTOM STONE for hituminous macadam of Massachusetts Route 202 relocation is mixture of No. 1 and No. 2 size crushed traprock. Compacted 3½-in. blanket rests on two 6-in. layers of rolled gravel placed on prepared subgrade.

THREE-WHEELED 12-ton roller compacts bottom stone. After thorough rolling, base course is keyed with sand broomed into voids and rerolled.

Massachusetts Builds High-Class BITUMINOUS ROAD

SPREADER BOX (below) drawn by dump truck distributes top or surface stone over sand-bound base course. Surface stone, No. 1 size crushed traprock is compacted to $2\sqrt[1]{2}$ -in. layer.



MASSACHUSETTS, long a leader in the development of penetration bituminous macadam roads, continues to expand and modernize its state highway system, using methods improved and refined during the 40-odd years that have passed since its early experiments with bituminous macadam surfaces. Typical of modern road surfacing in Massachusetts is a 3.7-mi. section of Route 202 north of Baldwinsville that is being relocated to raise it above the spillway of the Birch Hill flood control dam which has backed up water over the present highway at vari-

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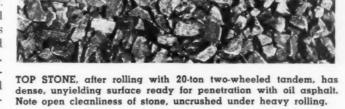


DISTRIBUTOR TRUCK sprays 12-ft. lane with oil asphalt, penetration 85-100, at rate of 2 gal. per sq. yd. At start of new application, truck begins run 15 ft. back on previously penetrated section and nozzles are opened 6 in. before reaching joint.

ous times, causing serious interruptions to traffic. Running through gently rolling terrain whose soil is predominantly a silty sand, the relocation consists of a 24-ft. paved roadway crowned ¼ in. per ft. and flanked by 6-ft. unpaved shoulders on each side. The roadway section is a 12-in. gravel sub-base covered with a 3½-in. sand-bound base layer of crushed stone topped with a 2½-in. surface of keyed, asphalt-penetrated stone. All layers are tightly rolled to true grade and cross-section with three-wheeled 12-ton rollers on all but the surface course, where 20-ton two-wheeled tandems are used. The inner 3 ft. of each shoulder is gravel, while the remainder is earth,

After clearing and grubbing, the subgrade is graded and compacted before the 12-in. sub-base of pitrun gravel, containing stones no larger than 21/2 in., is spread and rolled in two 6-in. layers. The subbase is covered with a blanket of crushed traprock of sufficient depth to form a 3½-in. layer after compaction with the 12-ton rollers. This base or bottom stone is a mixture of No. 1 stone (passing a 21/4in. sq. sieve with at least 85 percent retained on a 11/4-in. sieve) and a maximum of 40 percent No. 2 stone $(1\frac{1}{4}$ to $\frac{3}{4}$ in.). All stone is delivered in bottom-dump railway cars to a siding near the road where portable loaders transfer it

both sections being thoroughly rolled.



AFTER PENETRATION, 20-ton tandem (below), equipped with water spray on rolls to prevent asphalt sticking, compacts surface. Broom on roller will be lowered to sweep subsequently placed key stone into voids.



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SURFACE IS KEYED the day after penetration with ¾-in. stone spread at rate of 18 lb. per sq. yd. Planned delay in keying allows stone to be broomed into voids to minimize crushing under 20-ton rollers.

to dump trucks for delivery to the job. The stone is placed in two 12-ft. widths by spreader boxes drawn by the trucks. After the bottom stone is thoroughly rolled it is keyed with clean sand spread by dump trucks and hand-broomed into the voids. Rolling the sanded

bottom stone with 12-ton rollers compacts it into an unyielding blanket ready for the surface course.

The top or surface stone is also crushed traprock, but of No. 1 size, and is placed by the same spreader boxes. The strike-off plates of the spreaders are adjusted to give about a 31/2-in. depth of loose stone which will reduce to a 21/2-in. finished course when compacted with the 20-ton tandem rollers. After the stone has been thoroughly rolled it is penetrated with an oil asphalt (Mass. grade OA3; penetration 85-100) sprayed in 12-ft. widths by 1,500-gal. distributor trucks equipped with pumps, heaters and slotted-nozzle spray bars. Asphalt is placed at the rate of 2 gal. per sq. yd. at a temperature of about 350 deg. F.

After penetration, and before any additional material is spread, the stone is again rolled. Water sprays on the 20-ton rollers keep the asphalt-covered stones from sticking to the wheels. Key stone, ¾ in. size, is not placed until the day following the asphalt application to allow the asphalt to penetrate more thoroughly and to harden sufficiently to permit the key stone to be broomed into the



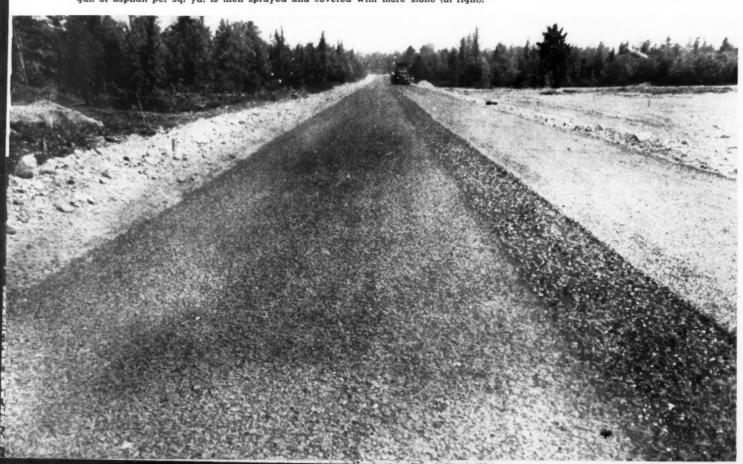
RESPONSIBLE for top-notch construction of Massachusetts Route 202 north of Baldwinsville are TIM KELLEHER (left), president. Kelleher Corp., contractors, Turners Falls, Mass. and GEORGE L. ESPER, resident engineer for Massachusetts Department of Public Works.

voids. The key stone is spread by trucks at the rate of 18 lb. per sq. yd. and is broomed and rolled.

After the surface has been tightly keyed, and immediately prior to the surface asphalt application, ½-in. pea stone is placed. This pea stone is evenly spread at 5 lb.

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BEFORE SEALING, ½-in. pea stone is spread (below) at 5 lb. per sq. yd. (at left) over keyed, penetrated surface. Seal coat of 3/8 gal. of asphalt per sq. yd. is then sprayed and covered with more stone (at right).



per sq. yd. and is then sprayed with the same type asphalt as is used for penetration, but at the rate of 3/8 gal. per sq. yd. To avoid a vertical joint through both asphalt applications and to minimize the possibilities of a fat streak at the road centerline, the surface or seal coat is sprayed on in one 11-ft. and one 13-ft. width. To complete the surface, pea stone is spread at the rate of 16 lb. per sq. yd. and is broomed and rolled. The resulting roadway has a durable nonskid surface with smooth-riding qualities greatly improved over earlier Massachusetts penetration macadam highways where the key and pea stone seal was less dense.

Job Personnel

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The work is being done by the Kelleher Corp., Turners Falls, Mass. under a \$204,127 contract with the Commonwealth of Massachusetts which will be reimbursed by the War Department from funds in its flood control appropriation. Francis E. Cassidy is superintendent for the contractor and George L. Esper is resident engineer for the Massachusetts Department of Public Works, of which M. J. Dalton is district highway engineer and Philip H. Kitfield is chief engineer. Joseph F. Cairnes is commissioner.



BACKING TRUCK pushes spreader box distributing $\frac{1}{2}$ -in. pea stone over asphalt-sealed surface at rate of 16 lb. per sq. yd. Surface will be broomed and compacted with 20-ton tandem roller.



COMPLETED PENETRATION MACADAM ROADWAY has tight surface and excellent riding qualities. Centerline joint in 24-ft. pavement is avoided by penetrating in two 12-ft. widths and sealing in widths of 11 and 13 ft.

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TWO TRACTORS LOAD SCRAPERS IN HEAVY SAND

PUSH AND SNATCH TRACTORS are both required to load heavy sand into Koehring Wheelers on part of the extension of Michigan Route 27 up the west side of

Houghton Lake, being done by Terry & Steadman, of Bay City, Mich. This firm has a 7-mi. stretch of the new route, and most of the fill comes from a huge sand hill

about midpoint on the job, requiring hauls up to 3½ mi. The 500,-000-yd. fill is placed at rate of 35,-000 yd. a week with ten Wheelers. S. Kozowlski is superintendent.



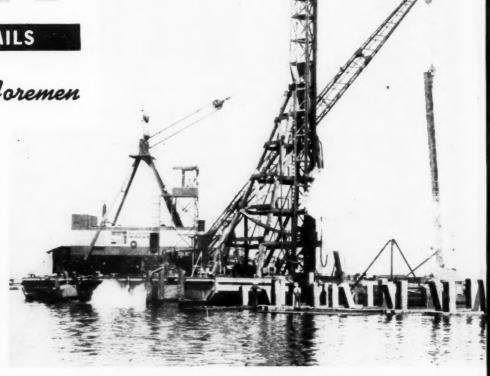
They Did It

CONSTRUCTION DETAILS

For Superintendents and Foremen

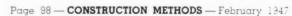


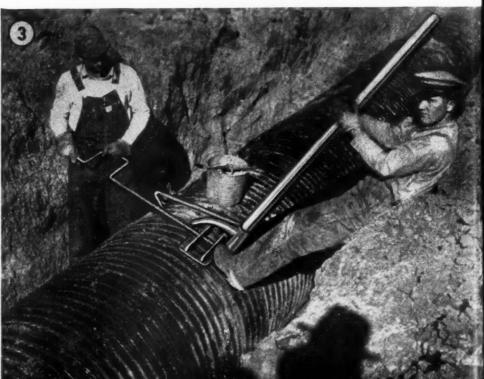




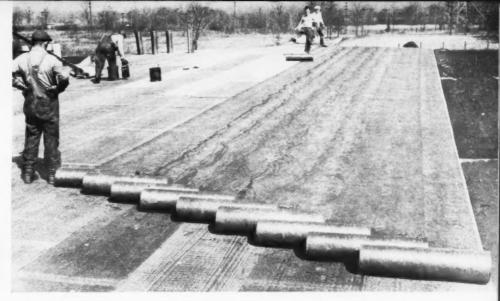
SPECIAL TOOLS aid installation of 72-in. Armco paved-invert corrugated drainage pipe at Army Air Base, Enid, Okla. Coupling spreader (1), made from square reinforcing rods by LEE HARRIS, contractor (2) holds ends of coupling band apart to permit easy insertion of next section of pipe. Cant hook (3) draws ends of coupling band together while bolts are tightened with speed wrench.

BIG FLOATING PILEDRIVER, operated by M. H. Golden Construction Co., drives 1,832 13-ton precast concrete piles 70 ft. long for four 1,400-ft. piers for U. S. Navy at San Diego, Calif. Driver barge carries revolving crane with 110-ft. boom for handling piles and A-frame mounted swing leads for driving both vertical and batter piles. Jetting under 250-lb. pressure aids driving.









GLASS FIBER ROOF COVERING, delivered to industrial building job in rolls each covering 864 sq. ft. of surface and weighing only 9 lb., light enough for girl to carry, is applied by conventional built-up roofing methods. New Fiberglas product is web of glass fibers bonded into thin porous sheet and used as carrying agent for bitumen. Glass fibers are not affected by heat, rot or decay.

TELESCOPIC DUMP TRAILER takes load from overhead tank hopper. At place of delivery, truck is unhitched from trailer and, after dumping load, will be backed into telescoping mechanism of trailer so body of trailer slides into that of truck. Truck will then dump trailer load in usual way. International truck body, operated by Blue Diamond Corp., of Los Angeles, Calif., is 8x12 ft. and trailer is 7½x12 ft. Capacity of each is 8 yd.



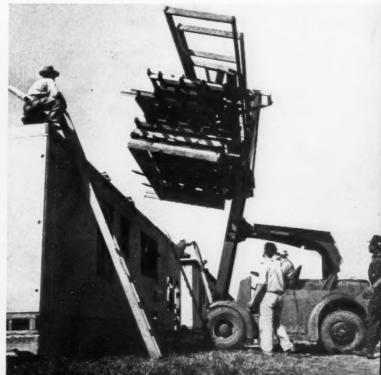
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FOR FINISHING concrete deck slab of long bridge over Pee Dee River in South Carolina, C. Y. Thomason Co., Greenwood, S. C., contractors, rigged up homemade 31-ft. longitudinal vibrating screed. Master ½-hp. gas-driven vibrator was spring

mounted on trussed pipe frame whose lower chord included flat steel screed plate cambered % in. Screed, always used in longitudinal position, was moved by hand. Samuel Blackmon, Jr., superintendent for Thomason on job, reports device saved considerable finishing time and labor.

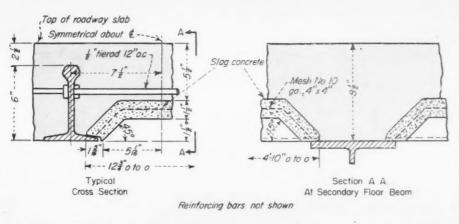
TALL REACH on Hyster fork lift on rubber-tired tractor (below) sets prefabricated sections on roof of Precision-Built Homes, Inc., dwellings on Pacific Coast.



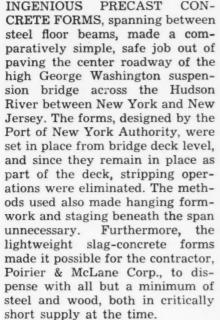


GEORGE WASHINGTON BRIDGE spanning Hudson River between New York City and New Jersey gets center strips paved to expand traffic carrying capacity. Only six of eight lanes were paved when bridge was opened in 1931.

Frecast Forms Simplify



DETAIL OF BRIDGE ROADWAY shows position of precast concrete form between bulbbeam longitudinals and secondary floor beams. Easily placed from bridge deck and left permanently beneath slab, precast panels enable all work to be done safely and speedily from top of bridge.



As originally opened to traffic in 1931, the bridge deck was 90 ft. wide between outside road curbs with a three-lane, 29-ft. concrete roadway on each side of an unpaved 32-ft. center strip. A great increase in traffic over the span during recent years made widening of the roadway desirable, so the open center section was paved to increase the width to eight traffic lanes with an estimated capacity of 20,000,000 vehicles per year. The center lane of the New York side span had been previously filled in,



MORE THAN 20.000 precast, slag-concrete forms simplify George Washington bridge paying job. Majority of form panels are similar to haunched section shown at right. Special flat section, left, allows 7-in. depth of road slab for embedment of curb anchor bolts.



CONCRETE OF EXISTING side roadways bulked against steel center curbs during original pour and must be cut to grade. Here Chicago Pneumatic Power-Vane hand tool grinds off excess concrete to provide smooth joint between old and new pavements.



FORMS ARE SEALED with grout to prevent loss of roadway mix. Slab reinforcing of ½-in. rods rests on bulbs.

Photos from Port of New York Authority

Suspension Bridge Paving



PRECAST FORM is slid to position along lower flanges of bulb-beams and beneath tierods. Form is placed on flanges after five or six lines of tierods are temporarily unbolted in each 60-ft. bay.

and Poirier & McLane's contract covered paving of 3,840 lin. ft. or about 14,000 sq. yd. of the center and New Jersey side spans. Their job also included removal of the existing structural steel curbs that bounded the center strip, and the

installation of new concrete curbs closer to the roadway centerline to increase by 5 ft. the width of each of the outer roadways and leave a 22½-ft., two-lane center strip.

Steel in the bridge floor system, set complete as part of the original construction, includes 6-in. longitudinal bulb-beam joists on 15-in. centers riveted to transverse secondary floor beams spaced 5 ft. 2 in. c. to c. The bulbs are continuous for the 60-ft. length of bridge panel and are tied together every 12 in. by ½-in. bolts through the webs 4 in, above the base of the members. The new roadway slab, similar in section to that originally placed, completely incases the bulb-beams and extends 21/2 in. above their tops. At bulbs and secondary floor beams the slab is 81/2 in. deep, but between these members the bottom of the slab is haunched to a 51/2-in. depth, giving a nominal average pavement thickness of 7 in. Slab reinforcement of tied 1/2-in. rods rests on top of the bulbs. Transverse steel is on 6-in. centers and longitudinal rods are 15 in. apart centered between bulb-beams. The slabs extend monolithically between the old side pavements, and between 3/4-in. cork expansion

joints at the 60-ft. panel points.

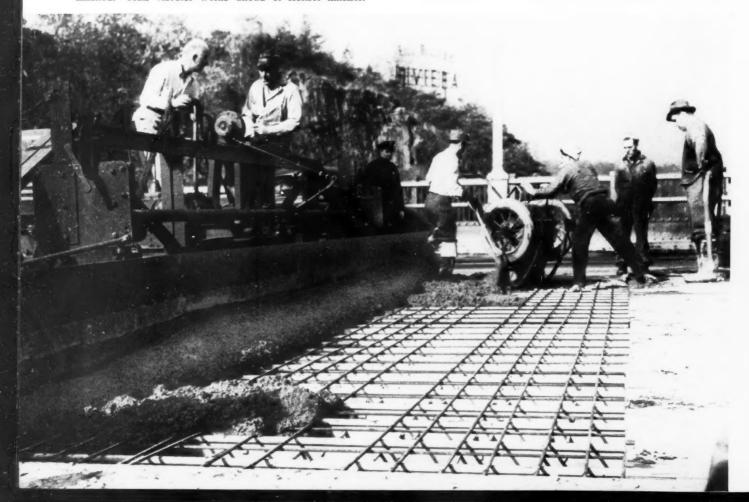
More than 20,000 precast concrete bottom forms for the slab pour were made in the contractor's yard and trucked to the job site. Generally 4 ft. 10 in. long and 123/4 in. wide to fill the opening bounded by two bulb-beams and two secondary floor beams, the precast panels were of two types-a normal haunched section and a flat slab where greater depth of roadway concrete was required for embedment of scuppers and curb anchor bolts. Both types were slag concrete 11/2 in. thick reinforced with 4x4-in. 10-ga. mesh.

Forms were placed by temporarily unbolting five or six lines of bulb-beam tierods in each bay, inserting the panels in the openings thus made and sliding them to position along the lower flanges of the bulb-beams. With the forms set, a stiff grout was poured around their edges to prevent loss of roadway concrete between the panels and the supporting beams. Immediately prior to pouring the deck slab, the precast forms were thoroughly wetted to prevent absorption of water from the mix.

Bridge pavement was 4,000 lb., air-entrained concrete with a $3\frac{1}{2}$ -to 4-in. slump. The mix con-

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TRANSIT-MIX CONCRETE (below) for slab is buggied to place over wood panel runways and is mechanically screeded and finished. Mall vibrator works ahead of Heltzel finisher.





ROADWAY SLAB is floated and broomed behind finisher. Finishing machine and finishing bridge ride on original pavement and span new 32-ft. slab. Note anchor bolts for curb dividing new pavement into 22-ft. center strip and two 5-ft. additions to side roadways. Two-lane center pavement will carry one-way traffic; direction of travel being varied to suit traffic volume during rush hours.

tained 7 sacks of cement, 1,218 lb. of sand and 1,925 lb. of 3/4-in. stone per cu. yd., or roughly 1:1.85:2.93, with 4.79 gal. of water per sack. To reduce dead load on the bridge, improve plasticity of the mix and form a more durable roadway surface, Darex AEA was added at 170 c.c. per cu. yd., resulting in a weight reduction of from 4 to 6 lb. per cu. ft. of concrete.

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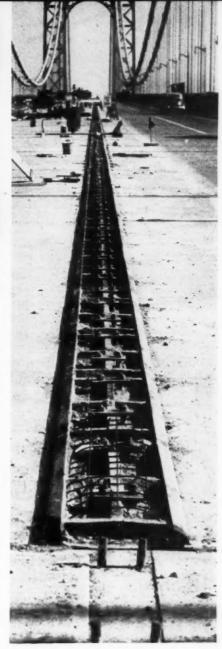
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Concrete was delivered to the job in 5-yd. transit-mix trucks and buggied to place. A Heltzel finishing machine with template cut to roadway crown rode upon the existing roadways and screeded and finished the slab in two passes with a 10-min. interval between. To assist the finisher in spreading the mix while operating over the long span of more than 32 ft., and to

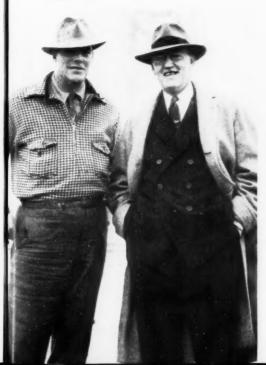
MEN IN CHARGE (below) of bridge paving project are WILLIAM BODILY, job superintendent for contractor, Poirier & McLane Corp., and GEORGE BRENNER, resident engineer for Port of New York Authority.

insure thorough incasement of bulb-beam heads, concrete was thoroughly vibrated ahead of the strike-off plate. Behind the finisher the slab was hand-floated and broomed, and cured with wet burlap for 10 days.

Although traffic was maintained at all times on the existing roadways, the contractor worked only from Tuesday mornings to early Friday afternoons to inconvenience as little as possible the extremely heavy week-end traffic on the bridge. Paving progressed at the rate of four panels or 240 ft. each full working day. The work was done under the direction of the Port of New York Authority for whom John C. Evans is chief engineer, Col. C. S. Gleim, engineer of construction and George Brenner, resident. For Poirier & McLane Corp., New York, contractors for the \$340,000 bridge paving project, William Bodily was superintendent in charge.



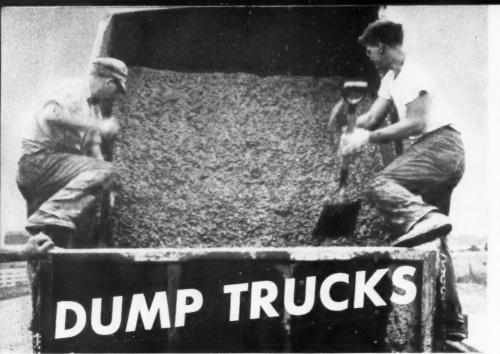
CAST IRON FRAME for 4-in. high, white-faced concrete curb is set in grout and is tied down by straps between anchor bolts. Bolts are cut and threaded 1-in. reinforcing rods.



ANCHOR BOLTS for new curb are driven into fresh concrete. Wood template spaces bolts and bored block insures correct depth of embedment. Previous pour, rear, is cured with wet burlap.







Haul Patching Concrete

By C. H. CASH

Assistant Road Construction Engineer Michigan State Highway Department Lansing, Michigan

CONTRARY TO USUAL PRACTICE, the Michigan State Highway Department permits concrete for highway patching to be hauled from central mixing plants in flatbed dump trucks. Where the distance between patches makes use of a paver or a portable batching and mixing plant impractical, a centrally located plant is set up

and concrete from it is delivered in ordinary trucks. Excessive segregation on hauls as long as 10 mi. is prevented by using a low-slump, air-entraining concrete that arrives on the job as a mix of more uniform quality than is usually obtained from a fleet of transit-mixers.

During the war period many

EXCESSIVE SEGREGATION results when batch is too wet. Soupy top layer has been dumped, while heavy settled material must be shoveled from truck body.

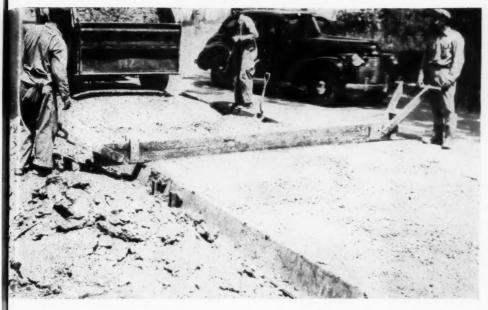
Michigan concrete pavements were subjected to severe truck traffic, and at the same time the normal highway reconstruction program was curtailed. In an effort to conserve these pavements, many of which were 20 to 25 years old, an extensive concrete patching program was launched in 1943 and has been continued during the succeeding three years. In 1943 the work was done mostly by regular highway maintenance forces but since that time it has been done by contract on a competitive bid basis. The yardage involved and the average unit costs are shown in the accompanying table. The detailed requirements for the size and shape of patches are similar to those given in the Highway Research Board Bulletin No. 6 of the Wartime Road Series entitled "Patching Concrete Pavements with Concrete," dated July 1943.

In patching Michigan's concrete highways, the old pavement is broken up by first drilling a series of holes at right angles to the centerline at each end of the proposed patch to establish weakened planes, and then breaking the pavement with a hammer-type, truckmounted breaker. Ball-and-crane type breakers were formerly permitted, but their use resulted

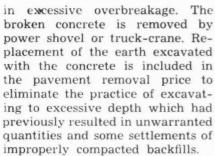
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PAVER (below), mounted on low-bed trailer, serves as central mixing plant for concrete highway patching. Concrete is delivered to patch in flatbed dump trucks.





WOOD STRIKE-PLATE levels concrete highway patch. Note lack of excessive segregation in concrete dumped by truck after long haul from central mixing plant.



Concrete is placed by any of three methods: by a standard paver which is moved from patch to patch, by transit-mix trucks, or by ordinary dump trucks hauling from a central mixing plant. Of

these, the paver at the site results in the best quality concrete but is often impractical because of the distance between patches and the hazards to traffic caused by the space required for paver operation. Concrete mixed in transit may be used on hauls not exceeding 15 mi., while for longer trips the water must be added and the mixing performed at the pour site. In general, concrete from truck mixers has proved less satisfactory than that from a central plant or from a paver because of the difficulty in controlling its water content with resultant variations in



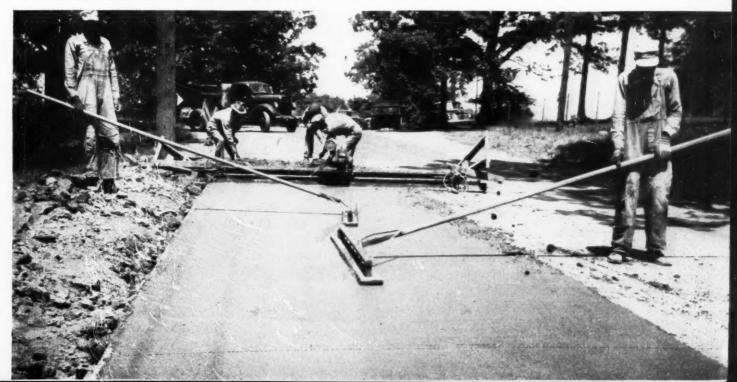
LOW-SLUMP CONCRETE made with airentraining cement has glazed surface but no free water after 10-mi, trip in ordinary dump truck.

consistency, strength and shrink-

The use of centrally-mixed concrete, termed the wet-batch method, has been successful in Michigan. Concrete is mixed in a paver or stationary mixer at the batching plant and is hauled to the patch in standard dump trucks. The distance for hauling wet-batch concrete without mechanical agitation is limited by a maximum time interval of 30 min. between mixing

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CONCRETE IS FLOATED (below) behind vibrating finishing screed. Uniform consistency of centrally mixed concrete with consequent equal shrinkage results in smooth-riding highway patches.





Pavement Patching Costs

Includes Removal of Old Pavement, Patching and Maintenance of Traffic

Year	Miles of Road Repaired	Sq. Yd. of Patching	Average Cost Per Sq. Yd.
1943	700 .	113,000	\$6.47
1944	689	100,891	6.50
1945	481	89,552	5.27
1946	308	57,400	6.45

igan limits

AFTER 17-MI. HAUL in dump truck without agitation, concrete has less than 1-in. slump. Michsuch hauls to 30 - min. maximum interval between mixing and placing concrete.

and placing, and 10 mi. is considered a safe haul. The wet-batch method is particularly adaptable to low-slump concrete as the stiff mixture is less susceptible to segregation than is a wet mixture. The ordinary tendency to use too much water is counteracted, since it is soon learned that the cure for segregation is less water, rather than more.

Michigan has been using air en-

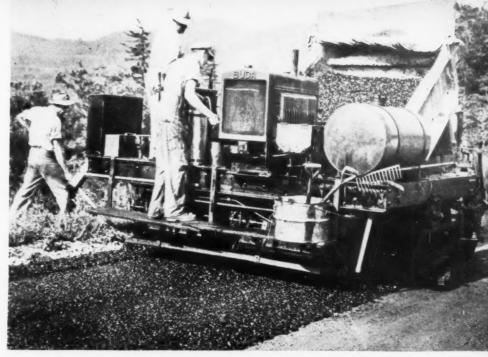
training concrete in ever increasing quantities since 1940 and now requires it for all road construction and some bridge work. The primary purpose has been to produce more durable concrete which will resist freezing and thawing and the action of chemicals used in snow removal. Other qualities are an improvement in workability and a substantial reduction in bleeding and segregation which is especially important where centrally mixed concrete is used without agitation in transit. Michigan specifications call for an air content of 3 to 6 percent, and tests are run on all projects to test this requirement. Preliminary results indicate that a satisfactory air content is retained under ordinary conditions, while mixes that segregate unduly because of excessive wetness or length of haul show a corresponding loss of air. A batch of 2- to 3-in, slump, air-entrained concrete which has been jarred about in a truck body during a 10-mi. trip is surprisingly uniform when it is dumped on to the subgrade.

EXTRA APRON PLACE INCREASES SCRAPER LOAD

AN EXTRA PLATE, 12 in. wide, welded to the top of the front apron added 2 vd. loose fill capacity to Koehring Wheeler scrapers handling heavy sand on the Terry & Steadman, Bay City, Mich., contract for extension of Michigan Route 27 at Houghton Lake. Here the contractor's master mechanic, Ray Lehmann, is pointing out the extra plate on one of the Wheelers.



Asphalt Hauled 30 Miles for Blue Ridge Parkway



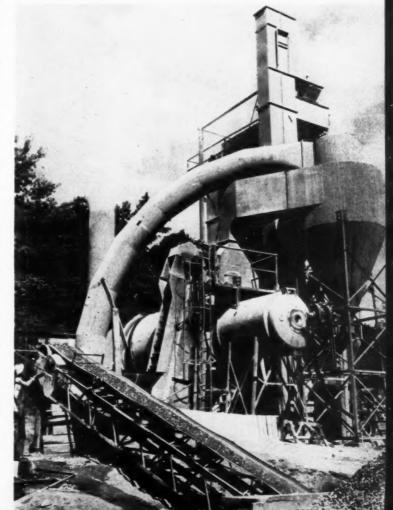
ASPHALT MIX is spread over one-half of 20-ft. pavement on tar-primed stone base by Adnun black-top paver. Oil from garden-type pressure sprayer at left of engine keeps asphalt from adhering to machine surfaces.

PAVING THE BLUE RIDGE PARKWAY, long deferred because of war, is again under way for the Public Roads Administration on a 28-mi. section between McKinney and Swannanoa Gaps northeast of Asheville, N. C. A cold-laid asphalt pavement of 250 lb. per sq. yd. is plant-mixed near the valley end of the project and trucked 30 mi. up the mountains through a section so remote that radio must be used for communication between mixing and placing crews. Paving operations of the contractor, J. R. Ford Co., Inc., of Lynchburg, Va., are hampered by long hauls, steep grades and sharp curves, as well as by frequent rains and low-lying clouds that often cover the mountain ridge which the road traverses.

The high quality asphalt pavement, PRA H-1, liquefier type, is mixed in a Simplicity central plant having a rated capacity of 60 tons per hr. The plant is set up adjacent to the nearest railroad siding, which is 30 mi. from the far end of the road project and 2,500 ft. lower. Asphalt, AASHO specification M20, penetration 85-100, is delivered by rail and stored in one 10,000-gal. and two 8,000-gal. insulated tank cars retired from rail service and blocked up on the ground near the plant. Two additional 10,000gal. cars hold naphtha liquefier and fuel oil, the latter being used to fire the aggregate drier. Crushed limestone for aggregate is delivered in hopper-bottom railroad cars that discharge into an under-track hopper from which a belt conveyor carries aggregate to the plant or to trucks for stockpiling. A 50-hp. boiler furnishes steam for asphalt heating as well as for operating gates on kettle, aggregate hopper, and mixer, while the plant itself has two 100-hp. International diesels that run hot and cold elevators, drier drums, shaker screens and pugmill.

Moisture in excess of 0.4 percent is removed from

the aggregates in a drier having two concentric drums, the inner drum heating the material and the outer one then cooling it to a temperature of 110 deg. F. Dust collected from the drier is returned to the aggregate in the hot elevator. The asphaltic concrete is mixed in 5,000-lb. batches proportioned as shown in Table 1. Aggregate is carefully weighed and is then dry-mixed in the pugmill for a few seconds before the naphtha liquefier is added through a



ASPHALTIC CONCRETE is mixed in Simplicity plant near one end of 28-mi. paving project. Belt conveyor unloads crushed limestone aggregate transported by rail from Tennessee quarry.

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PAVING PROCEEDS down hill from high points on scenic parkway traversing steep Blue Ridge Mountains. Pavement, PRA type H-1 with naphtha liquefier, consists of 170 lb. per sq. yd. bottom course and 80-lb. wearing course.



PAVING PROJECT IS SUPERVISED by R. F. TEMPLETON (left), superintendent for general contractor, J. R. Ford Co., Inc., Lynchburg, Va. The Barrett Division of Allied Chemical and Dye Corp. supplies plant-mixed asphaltic concrete to the paving machine and is represented by Superintendent H. E. ALLEN (right).

AT ASPHALT PLANT Barber-Greene bucket loader (below) transfers previously stockpiled aggregate to trucks to augment rail deliveries which are spotty due to freight car shortage.



metered valve serving a perforated pipe over the mixer centerline. Mixing is continued until all aggregate is thoroughly coated with liquefier (usually 20 sec. for bottom course and 1 min. for wearing course), after which the asphalt, heated to 275 deg. F., is introduced. The batch is mixed for two more minutes, the hydrated lime being dumped in by hand during the middle of the mixing cycle.

From the plant, 5-ton, two-batch loads are hauled in dump trucks to the paving machine, the longest haul being 30 mi. Although there is only a 2,500-ft. net difference in elevation between mixing plant and the high point of the paving project, the road dips through several gaps necessitating a total rise of 5,000 ft. The loaded haul requires trips up to 2½ hr., while the downhill return trip may be made in 30 min. Paving the mountain parkway is complicated by the weather differential often existing between plant and road. Short wave radio communication between the two controls the dispatching of loaded asphalt trucks to prevent their bunching up at the paver during mountaintop showers. The lique-

TABLE I - Material (lb.) per 5,000-lb. Batch

*	Bottom Course	Wearing Course	Top Dressing
Bin 4 (1½-in. sq. screen)	3090		
Bin 3 (¾-in. sq. screen)	1185	3029	
Bin 2 (*4 slotted sieve)	475	1165	******
Bin 1 (#8 slotted sieve)	S	466	4850(sand)
Asphalt (M-20, Penet. 85-100)	200	275	100
Liquefier (naphtha)	25	40	50
Hydrated Lime	25	25	

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TABLE II — Aggregate Grading
% By Weight Passing Square Screen (AASHO T-27)

Size	BOTTOM COURSE		WEARING COURSE		TOP DRESSING	
Size	Limits	Job Mix	Limits	Job Mix	Limits	Job Mix
1½-in. screen	100	100				
11/4-in. screen	95-100	97.5				
3/4-in. screen			100	100		
½-in. screen	10-35	25	95-100	97.5		
# 4 sieve	4-16	10	15-40	30	100	100
8 sieve			10-25	18	95-100	97.5
20 sieve			5-15	10		
50 sieve		1000	0-5	2	20-50	35
200 sieve			1000		0-3	0.5
Liquefier %	0,2-1,2	0.5	0.2-1.5	0.8	0.2-1.5	0.7
Hydrated Lime %	0.4-1.0	0.5	0.5-1.0	0.5	0.1-0.5	0.1
Bitumen (Sol. CS ₂) %.	3.5-6.0	4.0	4.5-7.0	5.2	1.0-4.0	1,5

fier-type asphaltic concrete is such, however, that it may be held in the trucks for as long as 48 hr. after mixing, although the old mix requires slower and more careful paver operation.

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The section of the Blue Ridge Parkway now being paved was open to traffic during the war years but because of its comparatively untraveled state, only minor repairs to its 8-in. crusher-run gravel surface are necessary before laying the asphalt. After soft spots and holes are filled with 4-in. layers of crushed-limestone waterbound macadam, the entire road surface is sprinkled, bladed with a patrol grader, and compacted with 10- and 12-ton three-wheel rollers to furnish a firm base for the asphalt pavement.

After preparation of the base, a two-course, 20-ft. pavement, widened up to 24 ft. on curves, is placed. The road surface is first primed with tar, RT-3, which is sprayed on at the rate of 0.4 gal. per sq. yd. by pressure distributor trucks that heat the primer to 120 deg. F. Three days after priming, a 170-lb. per sq. yd. bottom course having a 134-in. compacted thickness is placed with an Adnun black-top paver. The machine travels about 13 ft. per min. and normally lays a 10-ft. wide strip, while for curve widening, bleeders at the hopper ends are opened to allow the asphalt to cover the additional width. The bottom course is compacted with 10-ton tandem rollers shortly after it is placed, and again on the following day. Maximum allowable surface irregularity is ¼ in. as tested with a 10-ft. straightedge. Paving progresses for about 500 ft. in one lane before the adjoining section is paved.

After about 1,000 tons of bottom course has been placed, covering roughly a 5,000-ft. length of roadway, the paver puts down a wearing course at the rate of 80 lb. per sq. yd. This is compacted to a 34-in. thick blanket with surface irregularities held to 1/8 in. in 10 ft. About 24 hr. later, the wearing course is covered with 5 lb. per sq. yd. of plant-mixed top dressing spread from a truck and brushed

into surface voids with a broom drag. A single pass of a tandem roller completes the payement.

Paving operations are conducted only when the air temperature is above 50 deg. F. and the road surface completely dry. After showers, drying is speeded by sweeping moisture from the surface with a power broom.

Although the contractor originally intended to pave toward the plant from the far end of the project to avoid truck travel over the freshly placed pavement, this procedure was modified because of the grades and curves encountered. In general, paving proceeds from the crests to the valleys along the route because of the paving machine's difficulty in working up grades as steep as 8 percent and around 28deg, curves while pushing a loaded asphalt truck. While on the new surface, trucks are kept moving and no damage to the pavement has resulted.

General contractor for the 346,-143-sq. yd. paving project, estimated to cost \$424,000, is the J. R. Ford Co., Inc., Lynchburg, Va., for whom R. F. Templeton is superintendent. H. E. Allen is superintendent for the Barrett Division, Allied Chemical and Dye Corp., which is supplying and delivering the mix at the paver. E. G. Middleton, with offices in Roanoke, Va., is in charge of the work for the Public Roads Administration with H. M. Hancock as resident.

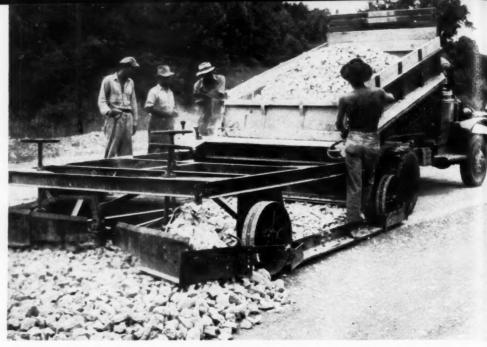
TRUCKS ARE WEIGHED on platform scales at right before and after loading. Between trips interiors of dump bodies are mopped with whitewash from drum at left to prevent asphalt sticking.



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ONLY FORMS for macadam base are 1-in. boards held in place by steel stakes and fill placed on outer side.



CRUSHED STONE for each 5-in. course of macadam base is distributed with Adnun spreader pulled by hauling trucks. Top course is here being constructed.

Virginia Builds ASPHALT-PAVED DUAL ROAD

NOW UNDER CONSTRUCTION on U. S. Route 11 west of the town of Salem, Va., is a 2.6-mi. dual-lane flexible-pavement expressway designed by the Virginia Department of Highways to carry extensive traffic, including a high percentage of trucks. The construction procedure developed by the general contractors—a combination of the Ralph E. Mills Co. and W. N. Jackson, both of Roanoke—is also permitting rapid progress, although the road being rebuilt must be kept open to traffic.

The existing road was of poor alignment and only two-lane width. It was much too narrow for present-day service and maintenance costs were high. Replacement of the old pavement with a divided dual-lane asphalt-surfaced highway was decided upon, the old roadbed to be widened and used where possible, but with the greater portion of the project to be on a new alignment.

A non-rigid pavement was chosen for the new road because good stone for macadam was available locally while there was a lack of sand for a portland ce-

> ment concrete pavement. The first cost was considered much lower than for a portland cement concrete. Moreover, maintenance expenditures are expected to be reasonable, for the flexible pavement. The final design calls for two 24-ft. roadways separated by a 4-ft. wide, raised, sodded median strip. Each pavement consists of a 10-in. waterbound macadam base put down on a 4-in compacted subgrade of limestone screenings. The macadam base is topped with 11/2 in, of mixed-in-place asphalt surface treatment. On tangents the two pavements are sloped away from the center median at the rate of 1/4 in. per ft. and the slope of the 8-ft. wide sodded shoulders is 3/4 in. per ft.

Regular excavation for the project totaled 207,000 cu. yd. and this

STEEL FORKS (below) are used to level up stone for macadam base and to key stone into place before compaction is begun.



Page 110 CONSTRUCTION METHODS February 1947 work is now completed. On the early phases of the project 15-cu. yd. carrying scrapers were used, and on the last part of the job 12-cu. yd. end-dump trucks loaded by shovel are utilized.

The fills are constructed in 6-in. layers compacted by sheepsfoot rollers to 95 percent of the maximum density at optimum moisture content.

Fills Topped With Screenings

All of the fills are topped with a 4-in. compacted thickness of limestone screenings. This material is end-dumped from the hauling trucks and spread with motor graders. A loose layer of 6 in. results in a 4-in. compacted thickness. To expedite compaction, which is with 10-ton steel-wheel rollers, considerable water is added between passes of the roller. The sieve analysis of the screenings is as follows:

Sieve Size	Percent Passing
3% in.	95 to 100
No. 20	25 to 75
No. 100	5 to 30

Compaction of the sub-base is followed by construction with limestone rock of a 10-in. water-bound macadam base put down in two equal layers. Rock considered satisfactory for the base must meet the following gradation:

Sieve	Size	Percent Passing
3 1/2	in.	95 to 100
2	in.	35 to 70
3/4	in.	0 to 10

The stone for each course of the base is distributed with an Adnun spreader pulled forward by the hauling trucks. In compacting each layer hand forks are used to eliminate the high spots and this work



AFTER STONE FOR BASE IS ROLLED by several passes with 10-ton steel-wheel Galion roller, screenings are added and worked into place with hand brooms.



SCREENINGS are hauled to desired point in trucks and distributed with hand shovels.



WATER REQUIRED in compacting macadam base is applied from Ford and Chevrolet trucks equipped with all-welded steel tanks made in contractor's shops.

BECAUSE ROAD MUST BE KEPT OPEN TO TRAFFIC, in few cases macadam base becomes rough and top few inches is torn up with rooting teeth of Caterpillar No. 12 motorized grader, leveled out, and rolled.







BEFORE TACK COAT for bituminous surfacing is applied .all excess screenings on macadam base are removed with Hough rotary broom and hand shovels.

is followed by two or three passes of a 10-ton steel-wheel roller. As compaction continues limestone screenings meeting the sieve analysis previously mentioned are added. The screenings are spread with hand brooms and worked into place with several passes of the 10-ton roller before water is added. With the application of the water more screenings are applied and rolling continued for several passes, the surplus screenings be-

ing swept off before the second 5-in. layer of the macadam base is put down. This layer is constructed in the same manner as the first. Total screening requirements for each layer are about 100 lb. per so, vd.

In preparing the macadam base for the surface treatment the surplus of fines is removed with a rotary broom and hand shovels. A prime coat of 1/3 gal. per sq. yd. of RC-2 asphalt is then applied by

distributor truck at a temperature of 125 deg. F. The prime coat is followed by addition with a stone spreader of from 15 to 20 lb. of crushed limestone of the following classification:

Sieve Size	Percent Passing
3/4 in.	95 to 100
3% in.	35 to 70
No. 4	5 to 25
No. 10	0 to 5

After the stone has been rolled with a 10-ton smooth-wheel roller from 60 to 65 lb. more stone of the same sieve analysis is added with a stone spreader. Next 0.6 gal. per sq. yd. of RC-2 asphalt is applied at a temperature of 125 deg. F. with a pressure distributor. The materials are mixed in place with an Adams No. 61 road planer or maintainer equipped with two mixing blades, each 10 ft. long, and one 12-ft. strike-off blade, the planer being pulled by a Caterpillar D-4 tractor.

Before compaction of the mixedin-place top is begun 5 lb. per sq. yd. of choke stone is added. This material is of the following sieve analysis:

Sieve Size	Percent Passing
3/s in.	95 to 100
No. 4	5 to 50
No. 10	0 to 10

Compaction is by a 10-ton steelwheeled roller. A few days later a

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ASPHALT PRIMER (below) is applied at rate of 1/3 gal. per sq. yd. at temperature of 125 deg. F. with Etnyre 1,000-gal. distributor mounted on International truck.

STONE FOR BITUMINOUS SURFACING (below) is applied with Buckeye aggregate spreader propelled by hauling truck operating in reverse.





seal coat is added. It consists of 0.2 gal of RC-2 followed by 10 to 15 lb. of choke stone of the gradation just listed. The choke stone is worked into place with the rotary broom and compacted by the 10-ton roller. The total thickness of the mixed-in-place material and the seal coat is about 1½ in.

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Paved Gutter

In all cut sections where the slope of the finished roadway is 4 percent or greater, the side ditches are paved with portland cement concrete. The concrete, 4 in. thick, is a 1:2:4 mix. Two plans are followed in constructing the lining. With one plan a rounded transition is used between the shoulder and backslope slabs, the backslope section being constructed on a 2 to 1 slope to fit the flatter slopes. This type is shown in the foreground of an accompanying picture. With the second plan a V-type ditch is built and the backslope concrete is constructed on a slope of 1 to 1. The overall width of the V-type ditch is 6 ft. horizontal measurement, with a depth of 1 ft. from the shoulder to the bottom of the V, which is 5 ft. from the edge of the paving nearest the roadway. The distance from the bottom of the V to the top of the backslope section is 11/2 ft. The overall width of the rounded section is 61/2 ft. and the distance from the bottom of the ditch to the top of the backslope section is 2 ft. Other dimensions with this paving are the same as with the V-type.

During all of the operations the road is kept open by shifting traffic from one side of the median strip to the other as progress of the work permits.

The completion time allowed the contractor for the 2.6-mi, project is 210 calendar days. His contract amounts to \$375,000 and calls for 67,000 sq. yd. of pavement in addition to the grading work. For the contractors C. G. Fraim is general superintendent.

For the Virginia Department of Highways C. S. Mullen is chief engineer, T. F. Loughborough, construction engineer, Joseph H. Wyse, district engineer for the Salem district, C. P. Johnson, resident engineer, and H. L. Turner, engineer in charge on the job.

The project is financed in part by the Public Roads Administration, for which M. B. Kinniken is state engineer in Virginia.

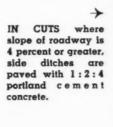
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FORM WORK for each concrete curb of center median is simplified by lightweight steel posts of type being driven into place above; this makes form ties unnecessary.



FORMS ARE COMPLETED for both curbs of section of center median. Short timber struts in each form are removed after concrete is placed in bottom of form.





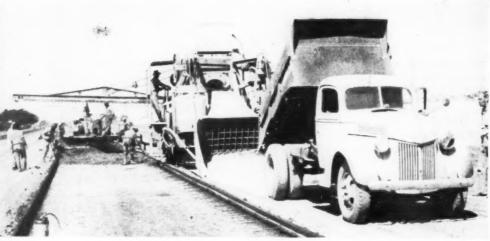
EARTH FILL (below) between curbs of median strip is delivered by a Caterpillar-powered La Plant-Choate carrying scraper and chuted into place.





ALONG SUBGRADE of new concrete pavement Blaw-Knox steel forms are set to make four-lane divided highway out of two-lane highway near Vacaville, Calif.

TWO LANES ADDED TO California Highway



LOADED TRUCKS, each containing two dry batches, back up to skip of mixer on Ransome 34E paver. Grid across mouth of skip keeps out sacks, boards, etc., which may have fallen into dry mix.

PAVER IS FOLLOWED by Jaeger-Lakewood finisher (below) which has attached to it Jackson vibrator screed.



CALIFORNIA is breaking one of its worst traffic bottlenecks by doubling the old two-lane road between Sacramento and Vacaville on U. S. 40 to San Francisco. Fredrickson Bros., of Emeryville, Calif., is just completing a 6-mi. widening project out of Vacaville on which they developed some new ideas on joint placing and slab finishing. On completion of this section, another widening job already under way and several miles of four-lane road on new alignment, there will be a four-lane restricted-access highway the 31 mi. from Sacramento to Vacaville.

Standards for the four-lane route are two 23-ft. slabs, consisting of 11-ft. outer lanes and 12-ft. inner lanes, the two roadways separated by a median strip 32 to 36 ft. wide. The widened sections are similar to one of these roadways.

Slabs are portland cement concrete 8 in. thick with weakened plane joints at 15-ft. intervals. The pavement was poured in single-lane widths, and the longitudinal joint was a tongue-and-groove design with dowels on 30-in. centers.

The contractor erected his own batching plant on the job and took

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railroad delivery on the aggregates. The batching equipment was fully automatic throughout. The automatic scales on the bulk-cement proportioning were independent of the scales for the aggregate. A Ransome 34E single-drum paver was used, and in all, 54,643 cu. yd. of concrete were placed.

Traffic Counts Made

State traffic counts on this twolane route indicate that a peak of traffic was reached in 1941; then there was a steady decline to 1945 when the traffic was about 57 percent under the 1941 peak. From June 1945 to June 1946 traffic on this route had the phenomenal increase of 136.5 percent to a volume 35 percent more than the prewar peak. This increase is materially greater, of course, than the general increase throughout the state, which has been on an average of 70 percent for the same period. Thus the old, two-lane road has been carrying traffic far in excess of its rated capacity.

Even during the war when the total traffic was low, the heavy truck traffic increased steadily. Trucks now comprise 20 percent of the total traffic volume. Moreover, speed checks, despite the high percentage of truck traffic, have indicated that the average speed of vehicles on this portion of the route is more than 46 mph.

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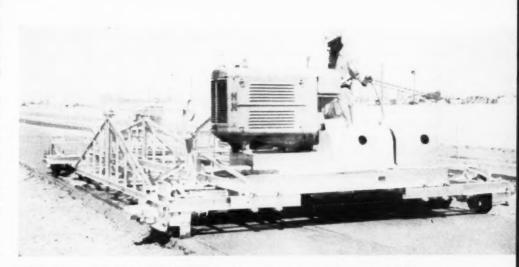
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The California Division of Highways has used estimates of time evaluation as a basis for some analyses of justifiable expenditure



THREE-MAN RIG, designed and built by Fredrickson Bros., is used to install transverse contraction joint fillers.



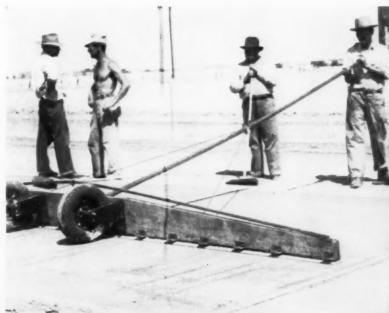
PAVEMENT IS FURTHER SMOOTHED by Johnson float after contraction joint fillers are placed.

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JOB PERSONNEL (below) includes, left to right: P. J. McHUGH, assistant superintendent, Fredrickson Bros.: WILLIAM L. HURD, resident engineer for California Division of Highways, GLEN V. FREDRICKSON and CHARLES FREDRICKSON, contractors.

FINAL FINISH (below) is performed by this cut float. Wheels on this tool are Fredrickson Bros. innovation.







AIR COMPRESSOR serving Hunt process curing compound nozzle is mounted on truck which moves along lane.

for increasing highway capacity. Heavy dump trucks now have operating rental rates in excess of 6 c. per min. The average pay for drivers is more than 2 c. per min.

With driving time saved per trip valued at 2.4c., for 10,000 vehicles traversing the new pavement at the present traffic rate, the savings would be \$240 per day or \$86,500 per year. If first costs were to be justified on this basis, the improvement would more than pay for itself in 7 years from the standpoint of time-saving alone.

The contract on the Vacaville end, begun early in 1946, involves the construction of two new lanes on the southerly side of the existing road, with a center division

strip of 36-ft. maximum width. The accompanying illustrations tell the story of how the paving was done.

Tie-bolts or construction joint dowels were rigidly bolted to the steel headers by drilling and threading holes in the headers and using nuts on the far side. The more usual method is to fasten the tie-bolts to a wooden dummy construction joint mounted on the header and support the free end of the bolts with concrete briquettes.

A rig for inserting dummy contraction joint fillers, illustrated herewith, was manned by three men. After the job got under way it was discovered that by the mere

expedient of keeping concrete off the wheels, this rig would roll more smoothly and one less man was required to operate it.

State specifications require that the concrete be finished 4 hr. after placing by a cut float. The usual float is simply a hand-operated tool with a steel blade. By placing wheels on the float, as shown in one of the photos, the tool can be tipped up and moved from place to place. When in use the steel blade is in contact with the concrete surface and the wheels do not operate.

Superintending the job for Fredrickson Bros. are P. J. HcHugh and Glen Fredrickson. George R. Hubbard and William L. Hurd were resident engineers for the state.

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SUBGRADE IS WATERED (below) ahead of paver. View shows also doweled longitudinal joint.



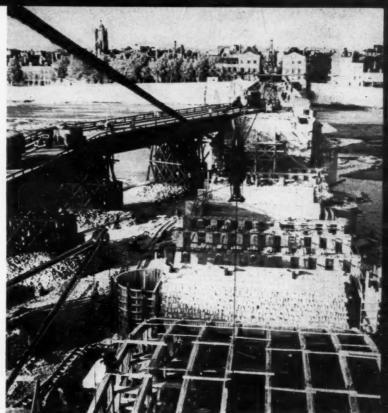


CORNISH UNIT HOUSE of prefabricated concrete sections is Cornwall's answer to British housing shortage. Aggregate for concrete comes from huge mounds of china-clay waste. Buildings, either one or two stories, are post and panel construction. Panels slide into grooves in posts, and horizontal joints are weathered with cove on top edge.

British Information Service Photo



OFFICIALS of Morrison-Knudsen Co. (below) inspect nearly-completed 40,000-kv. substation, which they are building for Idaho Power Co. near Boise. Concrete foundations were formed and poured for 120 structures, ranging from Lally columns and lighting standards to heavy bases for two 20,000-kv. transformers, each weighing 167,000 lb. Also included in job is control house. Work is under direction of Thomas F. O'Mara, division general superintendent, with Phil Soukup as project engineer; Everett Lakey, assistant superintendent; Emory Clark, job engineer, and Fred Harvis, foreman of electrical installations.



PONT ROYAL at Orleans, France, is being rebuilt after complete demolition during war. Bridge, shown here during reconstruction. Is now almost ready for traffic.

British Combine Photo

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ALL - ALUMINUM SPAN, 100 ft. long, is installed in seven - span railroad bridge over Grasse River near Massena, N. Y. Completely shop-assembled span of two deckplate girders is set by 30-ton traveler. It weighs 53,000 lb., as compared with 128,000 lb. for steel span of same length. Contractor is Har-Construction rison Co., of Pittsburgh,





INDUSTRY-WIDE BARGAINING...

Death Trap for Business, Suicide for Free Labor

If CONGRESS is to succeed in its present efforts to prevent strikes in key industries from devastating the nation, it will have to put a crimp in industry-wide collective bargaining. This kind of bargaining is designed to apply agreements between employers and organized workers on wages and working conditions to an entire industry.

Further, if extension of this type of bargaining is not curbed, there is reason to believe that it will undermine the freedom of both American business enterprise and American wage earners. For, while increasing the destructive power of labor disputes, the general spread of industry-wide bargaining would so concentrate the fixing of wages—by far the largest element in the cost of production—that government regulation would be a next short step. With that step taken, freedom for business enterprise and freedom for labor would be well on the way out.

Unfortunately, industry-wide bargaining is commonly regarded as presenting a general conflict between organized labor and employers, with unions favoring it and employers opposed to it. This mistaken notion raises the heat of much of the discussion without increasing the light. The fact is there is no such general conflict. Employers and organized workers are on both sides of the argument about industry-wide collective bargaining. For example, while some union leaders are characterizing as labor baiters all those who raise the slightest question as to the desirability of industry-wide bargaining, organized workers in the air transport industry are strenuously opposing that type of bargaining; and the employers are advocating it.

Some Employers Like It

The reason there is in fact no clear cut issue between employers and unions over industry-wide bargaining is readily understandable. It presents certain advantages to both sides in the bargaining process. For example, union advocates of such bargaining generally stress the fact that industry-wide agreement on wages protects wage standards from being undercut by lower wage areas and lower wage employers. By much the same token, however, employers who like it often emphasize the fact that industry-wide bargaining may save certain well-managed and prosperous companies from being singled out for particularly heavy wage exactions. This general point has been underlined in both the full-fashioned hosiery industry and the West Coast paper and pulp industry. There, local unions, affiliated with international unions, have protested that industry-wide collective bargaining prevents them from getting from especially prosperous employers wages as high as they could get if allowed to go it alone in collective bargaining.

So long as employers remain subject to the federal antitrust laws while unions are exempted, the balance of power in industry-wide bargaining would seem to be heavily weighted on the side of the unions. If, for example, employers were to announce an intention to match an industry-wide wage increase by an industry-wide price increase, there is no doubt that they would promptly be indicted for violation of the federal antitrust laws. Even so, the fact remains that some employers favor industry-wide bargaining while some segments of organized labor are against it.

A Clear Cut Public Issue

The industry-wide bargaining issue as it affects the public, however, is clear cut. It is concentration of economic power (in the hands of both unions and management) which can make industrial conflict devastating to the public welfare. At least five times within about a year—in steel, on the railroads, in the maritime industry and twice in the soft coal industry—strikes prompted by union efforts to impose industry-wide agreement about wages and working conditions have paralyzed large parts of the nation's economic life.

In soft coal about 90% of the production workers are members of the United Mine Workers. In steel

about 80% of the production workers are members of the United Steelworkers, C. I. O. In some other key industries there is a comparable degree of concentration of union control. In the face of such concentration many employers see no alternative but to get together on their side for industry-wide bargaining. But when they do so in key industries, the odds are lengthened that failure to agree on wages and related matters, will result in generally ruinous conflict. If agreement is reached, the chances are increased that it will take too little account of the welfare of the consuming public.

It is possible to have industry-wide bargaining on many subjects other than wages. But the main interest is wages; and the main drive is toward industrywide and ultimately nation-wide uniformity. Such uniformity is the deadly enemy of industrial decentralization and the pioneering expansion of industry in new areas. Why pioneer, with inexperienced workers, if the wage rate must be uniform for the whole industry? Moreover, it would also be hard to conceive of a more effective way to put a blight on local efforts to improve industrial relations than to make wage rates and other working conditions uniform throughout the industry and then the nation. However, among many other dangers, the overshadowing danger in industry-wide bargaining lies in its concentration of economic power.

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Wages Monopolized

On the average, the cost of labor accounts for about two-thirds of the total cost of all industrial products. The universal spread of industry-wide bargaining would thus concentrate in relatively few hands control of the greater part of the cost of industrial production. There is no reason to believe that even without disastrous strikes, such concentration would long continue free from government regulation. That would turn more earth for the graves of American business enterprise and American working men's freedom.

Those who believe that industry-wide bargaining serves the public well—and many sincere people do—stress the fact that, on the whole, it has worked in the industries where it has been tried over a considerable period. Most of the industries of which this is true, however, are not key industries. The pottery industry, the glassware industry, and the silk and rayon dyeing industry—to cite a few in which industry-wide bargaining has been practiced with considerable success—are important industries. But they are not industries in which strikes would have a ruinous impact on the nation. In contrast, a strike in the soft

coal industry as the result of a breakdown of industry-wide negotiations quickly becomes a national disaster. The dangers inherent in industry-wide bargaining are multiplied accordingly.

England No Guide

Those who think extension of industry-wide bargaining would be good for the public often emphasize the fact that it has worked smoothly in England, where it has been extensively practiced. Not the least of the things it has smoothed in England, however, is the transfer from private enterprise to state socialism of industries in which industry-wide bargaining by monopolistic unions and employer groups had so badly undercut competition that private enterprise had lost much of its justification. A general extension of industry-wide bargaining could be expected to have the same consequences in this country.

The best way to curb industry-wide bargaining is a question which lies beyond this discussion. Much would be accomplished if the federal government would discontinue its active promotion of industry-wide adjustments, in the fields of both labor and management, at which it has been busy ever since N. R. A. days. Still more would be accomplished if the federal antitrust laws were applied with even-handed justice both to unions and employers—a course urged in the 53rd editorial in this series. Perhaps a definite limitation of the scope of labor agreements would also be necessary.

The effects of industry-wide bargaining in increasing the extent of public regulation of industry will vary. They will, of course, be less pronounced in railroads and other public utilities, which are already extensively regulated, than they will be elsewhere. For unregulated industries, however, industry-wide bargaining carries the threat of extensive regulation and, along the way, of industrial conflict devastating to the public. In these excited times, to say what I have said here is to invite characterization by overheated partizans as a foe of legitimate union progress. That is perhaps not so bad, however, as to qualify as a pall bearer for both American business enterprise and some of the basic freedoms of American working men. That may well be the fate of those who blindly accept the expansion of industry-wide collective bargaining as being "in tune with the times."

Sames H. W. haw. N.

President McGraw-Hill Publishing Company, Inc.

Accounting for

SIXTH OF A SERIES OF SIX ARTICLES BY GUY M. CARSON,

TAXES

CONTRACTORS, in company with all business men today, are plagued with a myriad of tax paymentsincome, withholding, compensation, social security, unemployment, sales, franchise, excess profits and many more. Compilation and payment of these taxes may be a nightmare, causing endless worry and confusion, or they may be a fairly simple procedure. It all depends upon how you keep your accounting records. If your records are kept up to date as out-

lined in this series of articles, there is nothing mysterious or complicated about filing tax returns, but if you neglect your accounting, taxes mean trouble.

Federal income tax statements, and corresponding state income tax reports, where required, are probably the most troublesome of all

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Fig. 1 . . . INCOME TAX INSTRUCTIONS for both large and small operators, coupled with instructions on Income Tax Forms, ease job of compiling returns and guard against mistakes and omissions.

INSTRUCTIONS REGARDING

INCOME . TAX

(FOR THE UNINCORPORATED BUSINESS - CORPORATIONS MAY USE SAME GENERAL PROCEDURE.)

INCOME TAX PROBLEMS ARE SURPRISINGLY SIMPLE WHEN THE TARCO BUILDERS & CONTRACTORS SYSTEM IS USED. FOLLOW INSTRUC-TIONS IN KEEPING THE RECORD THROUGH THE YEAR, AND IT WILL BE SO EASY TO OBTAIN FIGURES FOR INCOME TAX RETURNS THAT YOU WILL BE AGREEABLY SURPRISED.

INSTRUCTIONS RE INCOME TAX - FOR THE OPERATOR WHOSE JOBS ARE LARGE AND WHOSE UNFINISHED JOBS AT THE END OF THE YEAR RUN INTO THOUSANDS OF DOLLARS THE FOLLOWING METHOD IS FAR MORE ADVANTAGEOUS. YOUR TAXABLE INCOME (SALES) AND YOUR DIRECT OPERATING EXPENSES ARE OBTAINED FROM YOUR JOB RECORD SHEETS OF YOUR FINISHED JOBS ONLY.

1. TAKE CASH RECEIVED (CREDITS) FROM FINISHED JOB SHEETS.

FROM THE "CASH RECEIPTS" RECORD TAKE ONLY MISCELLANEOUS INCOME (SUCH AS SCRAP SALES, ETC). TAXABLE INCOME MUST INCLUDE ALL INCOME FROM BUSINESS OR OTHERWISE BUT DOES NOT INCLUDE MONEY BORROWED OR INCOME ON UNCOMPLETED JOBS. PICK UP AS MISC. INCOME "DISCOUNT TAKEN" FROM COLUMN 2 OF CASH PAID OUT RECORD.

TAKE DIRECT OPERATING EXPENSES (DEBITS) FROM FINISHED JOB SHEETS.

4. FROM YOUR CASH DISBURSEMENTS RECORD, TAKE ALL INDIRECT OPERATING EXPENSES, COLUMNS 10, 11, 12 AND 13 and office overhead expenses, columns 14 to 18 inclusive, also "other" expenses in column 21.

(bon't take personal items from column 20.) if you have carried totals forward from month to MONTH FOR THE ENTIRE YEAR, ALL YOU HAVE TO DO IS TAKE THESE TOTALS AT THE END OF THE YEAR. OTHERWISE, IF KEPT MONTHLY, RECAP THE MONTHLY TOTALS. DISCOUNT ALLOWED IS OBTAINED FROM CASH RECEIPTS

YOUR INCOME FOR TAX PURPOSES WILL BE THE AMOUNTS OBTAINED FROM STEPS NO. 1 AND NO. 2 ABOVE. YOUR EXPENSES FOR TAX PURPOSES WILL BE THE AMOUNTS OBTAINED IN STEPS NO. 3 AND NO. 4 ABOVE. DO NOT INCLUDE ANY UNFINISHED JOBS IN STEPS NO. 1 AND MO. 3. YOU MUST INCLUDE ALL INCOME AND ALL DIRECT OPERATING EXPENSES ON FINISHED JOBS DURING THE YEAR EVEN THOUGH SOME OF THE EXPENSE OR INCOME WAS EXPENDED OR RECEIVED IN THE PRECEDING YEAR. THUS ALL JOBS ARE ULTIMATELY REPORTED.

INDIRECT EXPENSES, OFFICE AND "CTHER" EXPENSES AS DESCRIBED IN STEPS NO. 3 AND NO. 4 DO NOT PERTAIN TO ANY SPECIFIC JOBS AND THESE EXPENSES SHOULD THEREFORE BE TAKEN, ALL OF THEM, FOR THE ENTIRE TAXABLE YEAR.

INSTRUCTIONS RE INCOME TAX - FOR THE OPERATOR WHOSE JOBS ARE SMALL AND WHOSE UNFINISHED JOBS AT THE END OF THE YEAR ARE NOT ORDINARILY LARGE ENOUGH TO THROW THE TAXABLE INCOME AND EXPENSES TOO MUCH OUT OF LINE THE FOLLOWING IS CONSIDERED THE SIMPLER METHOD.

- 1. TAKE ALL INCOME AS SHOWN IN "CASH RECEIPTS", AND "DISCOUNT TAKEN" FROM COLUMN 2 OF CASH PAID OUT RECORD.
- 2. TAKE EXPENSES INCLUDING LABOR AND MATERIAL FROM "CASH PAID OUT", AND DISCOUNT ALLOWED FROM CASH RECEIPTS RECORD.

(NOTE: WHEN USING THIS METHOD PAY NO ATTENTION TO WHETHER OR NOT JOBS ARE FINISHED.)

DEPRECIATION ON EQUIPMENT SHOULD ALSO BE TAKEN ON TAX RETURN. THE ORDINARY SINGLE ENTRY SET OF BOOKS DOES NOT PRO-VIDE FOR DEPRECIATION BUT IT IS A DEDUCTIBLE ITEM AND SHOULD BE COMPUTED FOR TAX PURPOSES. THE ABOVE WILL SHOW TAXABLE INCOME AND EXPENSES OF YOUR BUSINESS. IN MAKING TAX RETURN CERTAIN PERSONAL ITEMS SHOULD BE INCLUDED — FOR EXAMPLE, REAL TAXPAYER ARE DEDUCTIBLE - SEE INSTRUCTION SHEET ON TAX RETURN BLANK. ESTATE TAXES ON RESIDENCE OF

IT IS SUGGESTED THAT YOU DECIDE WHICH METHOD BEST FITS YOUR BUSINESS AND ADOPT IT. ONCE ADOPTED YOU MUST USE THAT METHOD HENCEFORTH. THE FIGURES OBTAINED BY THE METHOD SELECTED SHOULD BE TAKEN TO A PUBLIC ACCOUNTANT OR INTERNAL REVENUE AGENT FOR PREPARING TAX RETURN UNLESS THE TAX PAYER IS VERY FAMILIAR WITH TAX LAWS AND REQUIREMENTS. IF TAX RETURN HAS HERETOFORE BEEN FILED ON A DIFFERENT BASIS, THE PUBLIC ACCOUNTANT WILL KNOW WHAT STEPS TO TAKE TO HAVE THE BASIS CHANGED TO ONE OF THE ABOVE METHODS.

Form 678 Tallman, Robbins & Co.

Contractors...9

COMPTROLLER, TALLMAN, ROBBINS & CO., CHICAGO, ILL.

your tax returns. There is no magic formula by which income tax returns are automatically made, but proper accounting, where expenses and income are classified and segregated and all required information is available, makes the job relatively easy.

Two sets of instructions regarding income tax, taken from the Contractors and Builders Simplified Accounting System, are shown in Fig. 1. The top set applies to

large operators, the bottom set to the smaller contractors. These instructions supplement those included in the Income Tax Forms, and should enable the contractor to compile his own taxes.

There are so many taxes in business today that a Tax Calendar is needed as a reminder when, where and how to pay each of the several taxes. A number of these calendars or tax schedules are available. The Accounting System

described in these articles is equipped with a complete Tax Calendar in the back of the binder. Under each month all the taxes which have to be paid during that month are listed and the date shown on which the return is due.

Shown in Fig. 2 is one of four pages of the Tax Calendar included in this accounting system. It is indicative of the entire calendar although space does not permit showing the entire year. This one

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Fig. 2 . . . TAX PAYMENTS come so thick and fast that Tax Calendar, such as this one, is necessary to keep track of them. This is first page of four-page calendar for entire year.

THE TARCO TAX CALENDAR JANUARY FINAL DATE AMENDED FEDERAL INCOME TAX ESTIMATED RETURN MAY BE FILED IF NECESSARY TO CORRECT ESTIMATE FILED MARCH 15 OF PRECEDING YEAR AND FOURTH QUARTER PAYMENT TO BE MADE (IF PAID QUARTERLY). IN LIEU OF AMENDMENT, FINAL RETURN MAY BE FILED FOR THE YEAR JUST ENDED (SEE INSTRUCTION NO. 1 BELOW). SOCIAL SECURITY TAX TO BE FILED ON FORM SS NO. 14 FOR OCTOBER, NOVEMBER AND DECEMBER OF PRIOR YEAR. (SEE JANUARY 31 INSTRUCTION NO. 2 BELOW.) JANUARY 31 STATE UNEMPLOYMENT COMPENSATION REPORT TO BE FILED WITH PAYMENT FOR OCTOBER, NOVEMBER AND DECEMBER OF PRIOR YEAR. IN THE STATE OF ILLINOIS. IF YOU DID NOT HAVE SIX OR MORE EMPLOYES IN PRIOR YEAR IN NON-EXEMPT EMPLOYMENT WITHIN THE STATE WITHIN EACH OF TWENTY DIFFERENT WEEKS, YOU ARE ENTITLED TO APPLY FOR TERMINATION OF COVERAGE FROM THE STATE UNEMPLOYMENT COMPENSATION TAX ON FORM UC-IC. (SEE INSTRUCTION NO. 3 BELOW). ALL ILLINOIS. TAXPAYERS, HOWEVER, ARE SUBJECT TO THE ILLINOIS UNEMPLOYMENT COMPENSATION ACT IF THEY ARE SUBJECT TO THE FEDERAL UNEMPLOYMENT TAX RETURN TO BE FILED ON FORM 940 WITH PAYMENT FOR PRIOR YEAR. (MAY BE PAID IN FULL -OR ONE-FOURTH ON EACH OF THE FOLLOWING DATES: JANUARY 31, APRIL 30, JULY 31 AND OCTOBER 31.) FEDERAL UNEMPLOYMENT TAX IS DUE ONLY ON EIGHT OR MORE EMPLOYEES AS IN PRIOR YEARS AND IS NOT AFFECTED BY THE STATE REQUIREMENT OF SIX OR MORE. TAX IS DUE IF EMPLOYER HAD EIGHT OR MORE EMPLOYEES WORKING ANYWHERE IN THE UNITED STATES DURING TWENTY OR MORE WEEKS OF THE YEAR. (SEE INSTRUCTION NO. 3 BELOW.) FEDERAL WITHHOLDING TAX TO BE FILED ON FORM W-1 FOR OCTOBER, NOVEMBER AND DECEMBER OF PRIOR YEAR WITH PAYMENT (OR BANK RECEIPT). DUPLICATED OF FORMS W-2 REV. (FURNISHED TO EMPLOYEES) ARE TO BE FILED WITH FORM W-3. (SEE INSTRUCTION NO. 4 BELOW.) FEBRUARY FEBRUARY 10 IN CASE WITHHOLDINGS EXCEED \$100.00 FOR THE PRECEDING CALENDAR MONTH, TAXPAYER SHOULD REMIT TO HIS BANK AND SECURE RECEIPT FOR THE TOTAL AMOUNT WITHHELD FROM ENFLOYEES FOR THE PRECEDING MONTH. FEDERAL INFORMATION RETURNS ON FORMS 1096 AND 1099 DUE FEBRUARY 15th. RETURN TO SHOW DIVIDEND. INTEREST OR FEBRUARY 15 RENT PAYMENTS OF \$100.00 OR MORE TO ANY PERSON. FEBRUARY 28 STATE FRANCHISE ANNUAL REPORT FOR ILLINOIS CORPORATIONS TO BE FILED BEFORE THE END OF THE MONTH, WITHOUT PAYMENT. (THIS WILL VARY IN DIFFERENT STATES - WRITE YOUR "SECRETARY STATE" IF IN DOUBT.) IN CASE WITHHOLDINGS FYCEED \$100.00 FOR THE PRECEDING CALENDAR MONTH, TAXPAYER SHOULD REMIT TO HIS BANK AND MARCH 10 SECURE RECEIPT FOR THE TOTAL AMOUNT WITHHELD FROM EMPLOYEES FOR THE PRECEDING MONTH.

STATEMENT OF ASSETS AND LIABILITIES AS OF DECEMBER 31, 1946 ASSETS CURRENT ASSETS Cash on Hand Petty Cash Deposit with Bids Permits Notes Receivable Accounts Receivable on Finished Jobs Work in Process - not billed Securities Owned Material and Supplies on Hand Other Assets Total Current Assets FIXED, AND OTHER ASSETS Real Estate - Less Depreciation on Bldg. Trucks - less Depreciation Equipment - less Depreciation Furniture & Fixtures - less Depreciation Prepaid Insurance Other Assets LIABILITIES CURRENT LIABILITIES Accounts Payable Notes Payable Loans Payable Wages Payable Deposits from Customers Accrued Taxes Accrued Interest Insurance Payable Other Liabilities Total Current Liabilities LONG TERM LIABILITIES Mortgage on Real Estate Mortgage on Equipment Long Term Contracts Other

is for the State of Illinois, but it is suitable for all states so far as Federal taxes are concerned, and also most states have the same State taxes.

NET WORTH - Difference between Assets & Liabilities

TOTAL LIABILITIES

Summary

This series of articles has shown the contractor the fundamental principles of accounting. By following them he should know how he comes out on each job, on what operations he makes money, on what work he loses money. A study of his accounts will reveal to the contractor the type of work he finds most profitable, and will enable him to shy away from unprofitable operations, or will show just how and why losses occur.

This information, however, is not sufficient. In addition to knowing where he is making his money, he must also know what is happening to it. It is one thing to make money, but it is another thing to keep it. Sometimes we go along thinking we are operating profitably and accumulating a surplus. It is a rude shock to find that somewhere along the line profits have slipped away.

A contractor can determine whether he is adding to his surplus and conserving his profits by making up a Balance Sheet or statement of Assets and Liabilities.

The firm having an accounting department should do this monthly. The smaller operator should do it just as often, but if a monthly statement is too great a chore, try to do it two or three times a year, certainly at least once each year. If but one statement is made up yearly, it should be done at the end of the year, or at the end of an unusually busy season.

If you have your own accounting

department you will find compilation of the balance sheet no trouble. The smaller operator may do it in one of two ways: he may call in a public accountant or he may elect to do it himself. In the latter case it is satisfactory to take an inventory of all Assets and Liabilities and find the net worth by subtracting liabilities from assets.

By comparing net worth with that at the end of the preceding period, the PROFIT for the period can be determined. The statement will also tell whether you are conserving your profits or not.

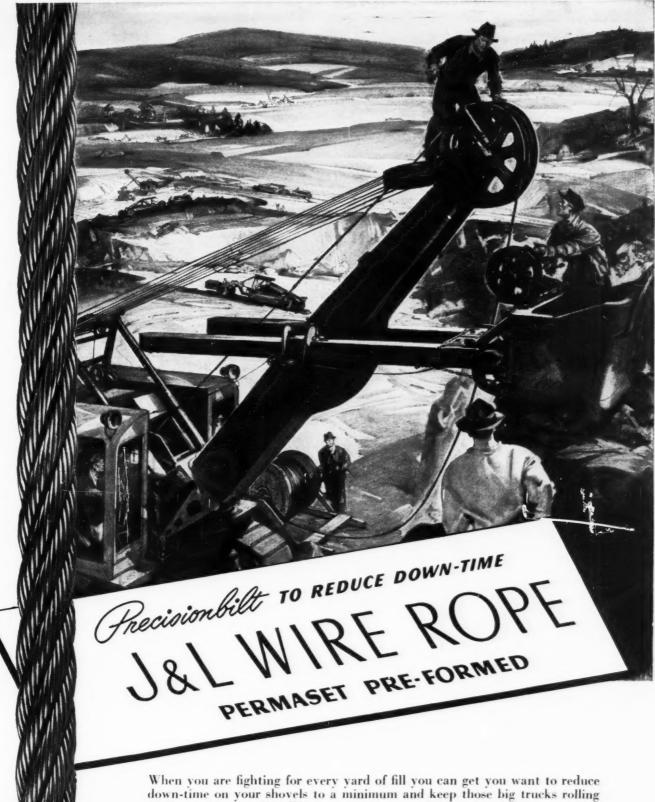
The great danger in this procedure is that something may be overlooked. Therefore a very thorough inventory and check-up of each and every asset and liability is necessary, otherwise the statement may be in error.

No definite pattern nor special form is needed for this net worth or asset and liability statement, but the one shown in the accompanying table gives the idea and is self-explanatory. Once the statement is started, it is easy to carry forward, because the previous statement may be used as a guide to make sure nothing is overlooked.

One further word regarding the evaluation of assets, especially equipment: always allow for depreciation. Do not list a machine or truck or other piece of equipment at the same price time after time. Figure conservatively. Allow plenty for depreciation, and in the listing of work in process do not overestimate. Put it in at cost or selling price, whichever is the smaller. Incidentally, this statement is valuable when establishing credit relations with banks and credit rating agencies.

The contractor must not only be a good operator, but he must also be a good business man to succeed in the contracting business today. There was a time when a man could keep his office under his hat, but that time is long past. A good accounting system, as described in these articles will surely contribute to success and greater profits.

EDITOR'S NOTE—This concludes the series on Accounting for Contractors. Reprints of all six articles bound into a single pamphlet are available at 50¢ each from Tallman, Robbins & Co., 314 W. Superior St., Chicago 10, Ill. The author, comptroller of the company, welcomes comments and questions on the subject.



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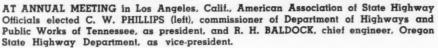
PITTSBURGH 30, PENNSYLVANIA

J&L Precisionbilt PERMASET PRE-FORMED WIRE ROPE

Present and Accounted For. A PAGE OF PERSONALITIES







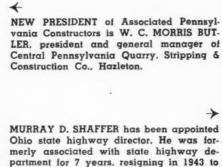


ELECTED PRESIDENT of General Contractors Association of New York is JOHN A. REJLLY vice-president in charge of New York and New England areas for Arundel Corp., New York.





NEW MANAGER of American Road Builders Association County Highway Officials Division and Municipal Division is HUBERT K. BISHOP (below), former deputy commissioner, U. S. Public Roads Administration. He will assist in activities of American Institute of Local Highway Administration, which was founded at 1946 ARBA convention.



J. ROLAND CARR (below) has been appointed regional editor of "Construction Methods" and "Engineering News-Record" at Cleveland, Ohio, where he will make his headquarters in McGraw-Hill offices in Hanna Building. His territory will include Michigan, Ohio, Indiana and the Ohio River and Lower Mississippi River Valley areas. He is an experienced editor, serving for last four years as editorial representative of E. N.-R. at Chicago. A graduate of Kansas University, he was formerly associated with American Bridge Co. and Wyoming and Kentucky state highway department.

become engineer - director for Macadam

Pavements, Inc., Columbus.



ASPHALT INSTITUTE has elected C. WAYNE BARBOUR (below) as its president and chairman of executive committee. One of founders of Allied Materials Corp. in 1932, Mr. Barbour is now president of this Oklahoma City company.







Welded Steel Cages Tie-in Columns and Roof

WELDED steel cages are used for tie-in between tubular columns and the reinforcing structure of a roof in a building addition erected in Cleveland, Ohio. Architects: Cutting & Ciresi.

The reinforced concrete structure is 60' x 182' with a wing 105' wide. So that another floor may be added later, the roof is heavily reinforced to take 400 lbs. per sq. inch.

Details of the welded steel cage and the top of the tubular column are sketched in Fig. 1. The cages are made of 34" round reinforcing bars, formed into rectangles and butt

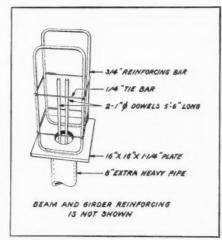


FIG. 1

welded. These rectangles are tied together with ½" tie rods, tack welded to the bars.

Fig. 2 shows how the steel cages are welded, on both sides of each leg, to the top plate of each column by a 4" fillet weld using 3/6" "Fleetweld 5" electrode.

The tubular columns are 8" diameter, extra-heavy pipe. Plates measuring 16" x 16" x 1¼" are shop-welded to the column ends with a ¼" fillet all around.

The building has ten columns 17'-10" long and two which are 21'-8" long.

Fig. 3 shows one column and steel

cage, and the framework used to support forms for concrete girders,



FIG. 2

beams and floor slabs.

Fig. 4 shows roof during a later stage of construction with reinforcing bars for girders and beams in place, ready for placing of concrete.

The reinforced concrete girders are 28" deep and are haunched down at the columns. Reinforcing

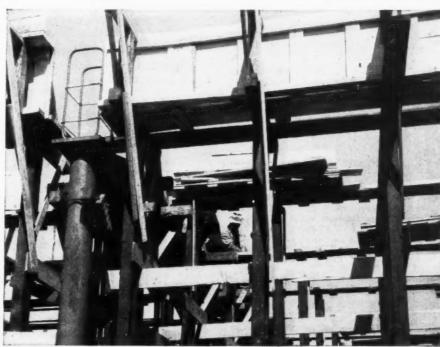
bars in girders are $1\frac{1}{8}$ " square and those in the beams are 1" round. Strap iron frame shown in center of picture will have anchor bolts through the four holes for future second-floor column.

The Lincoln Electric Company for years has been publishing a series of Studies in Structural Arc Welding. These may be obtained by writing to The Lincoln Electric Company, Dept. 291, Cleveland 1, Ohio.



FIG. 4

FIG. 3



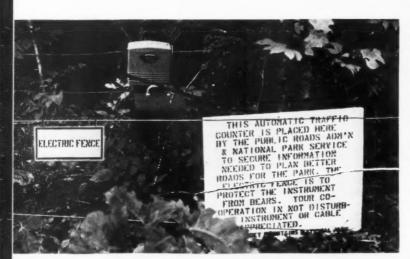
(Advertisement)

TIMBER TRESTLE (below), braced by lashed poles, carries water 50 ft. above jungle stream to Brazilian diamond fields. Roughhewn boards of flume are battened inside to prevent leakage.

Triangle Photo







BEARS TRYING TO INVESTIGATE automatic traffic counter in Great Smoky Mountains National Park near Gatlinburg, Tenn., are shocked by electrically charged wire fence powered by portable battery chained to tree. Counter is one of several set up by U. S. Public Roads Administration and National Park Service.

WINGED AUTOMOBILE (below) is used to test tires traveling at 90 mph. over circular course on dry lake near Lancaster, Pa. Plane wing section, designed by U. S. Rubber Co. engineers, creates inward thrust to counterbalance centrifugal pull on turns. When attached vertically to side of car, air foil develops side thrust just as airplane wing develops lift, so wear on tire treads is equal on all four wheels as in straight driving.





BRICK END WALLS, chimneys and foundations await arrival of Swedish wooden prefabricated house to be erected by Cheltenham Rural Council for British agricultural workers.



Page 126
CONSTRUCTION METHODS — February 1947



On this Camden, N. J., Overpass, saw-tooth faces of Atlas White Reflecting Curb are alternated in 10-ft. sections for either inbound or outbound traffic. Designed by N. J. State Highway Department. General contractor, Francis A. Canuso & Son, Philadelphia; curb sub-contractor, Frapaul Construction Co., Rochelle Park, N. J.

As One-Way Traffic Alternates...So Does CURB VISIBILITY

One-way traffic alternates on this overpass...moving inbound, toward Philadelphia, when peak load is in that direction; reversing, outbound, at other hours.

Either way, night or day, driving is made safer . . . because both sides of the road are edged with Atlas White Reflecting Curb. Its saw-tooth faces are placed in 10-ft. sections which alternately face inbound and outbound traffic. Thus, no matter which way traffic flows, saw-tooth faces catch the headlights' rays, reflect them back to the driver and form a highly visible traffic guide.

Reflecting Curb, made with Atlas White Cement, promotes safety on any highway. Send for further information. Write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N.Y.



A smooth curb wastes the car's headlights. It reflects light away from the driver. Edge of road is difficult to see. Driving dangers are increased.



White Concrete Reflecting Curb utilizes the car's headlights. Saw-tooth faces mirror the light back to driver, form a continuous bright ribbon of light at the road's edge. Driving is safer.

CM-RM-49

H UNIVERSAL ATLAS PRODUCT

ATLAS WHITE CEMENT

For White Concrete Reflecting Curb



"THE THEATRE GUILD ON THE AIR"-Sponsored by U. S. Steel-Sunday Evenings-ABC Network

by gri-



Here is REAL information about hose couplings — how to buy them, how to install them, how to use them, how to get the most out of your equipment. Facts that will save you time and money. Handy size — just right for your pocket.

If you buy or use hose couplings, you should have this book!

Remember, LE-HI Hose Couplings and Fittings are sold only through leading distributors and rubber manufacturers. If you don't know the name of your nearest LE-HI distributor, write us direct!

Remember . .

LE-HI MAKES A GOOD CONNECTION!

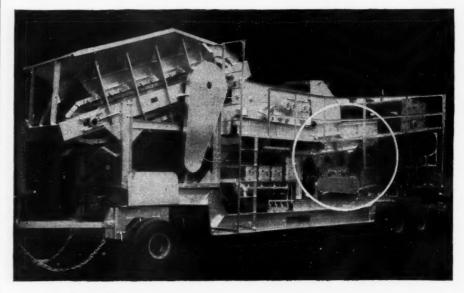


HOSE ACCESSORIES CO.

2738 N. 17th Street, Philadelphia 32, Pa.

CONSTRUCTION EQUIPMENT NEWS

FEBRUARY 1947 REVIEW
of Construction Machinery and Materials



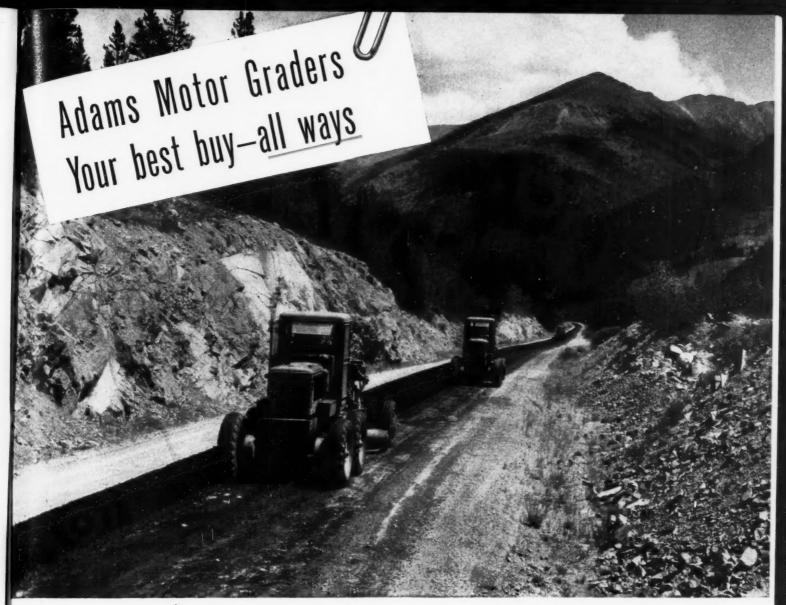
PORTABLE CRUSHING PLANT-Reaching and supplying crushing markets anywere, at any time, new Dixie portable crushing plant reduces quarry-run stock to minus 1 in. or to agstone size in one operation. It is said to crush 100 to 150 tens per hour. Producing any combination of sizes from 85-percent rock to 100-percent agstone, it takes wet or sticky material without clogging. Feed is direct from shovel; no intermediate conveyors or trucks are required. Plant includes: 40 in. x 10 ft. apron feeder; 4x8 ft. two-deck vibrating screen; 36-in. belt conveyor; Caterpillar engine. Complete unit is mounted on chassis with 24 pneumatic-tired wheels. Crusher is driven by V-belts from engine. All other equipment is driven by individual electric motors, powered by separate generator set.-Dixie Machinery Mfg. Co., St. Louis and New York.

CONCRETE MIXERS — End discharge feature of 3½-S Dandie concrete mixer leaves wheelbarrow spotting area unobstructed, eliminates turning and backing with loaded wheelbarrow. Mixer can be

approached from either side or from end. End tilter trails fast, because it rides on leaf springs. Wheels run



on anti-friction bearings. Air-cooled engine won't freeze up in winter, heat up in summer. Big hand wheel makes it easy to tilt loaded drum for discharge. Tow pole is pushed down, not up, to move filter, which makes hand spotting easier and eliminates danger of tipping when spotting. — Kwik-Mix Co., Port Washington, Wis.



rward Speeds SAVE TRAVEL TIME · SPEED OPERATIONS · CUT JOB COSTS

REGARDLESS of the type work you are doingditch cutting, bank cutting, blading, scarifying, aggregate mixing, spreading-Adams' 8 overlapping forward speeds provide instantly the right speed for doing the job at the fastest practical rate.

This means more efficient work-more work per day-more profitable operation. And Adams' high transport speeds (up to 21 m.p.h.) importantly reduce costly, non-productive travel time to jobs and between jobs.

Visit your local Adams dealer. He'll show you how and why Adams Motor Graders are your best buy-in this way-and all ways.

J. D. ADAMS MANUFACTURING CO. - INDIANAPOLIS, INDIANA

Motor Graders Elevating Graders

Leaning Wheel Graders



WARRINGTON-VULCAN Single-Acting Steam PILE HAMMERS



On tough pile driving jobs the Single-Acting Warrington-Vulcan has been a favorite since 1887. It's picked for the tough ones because it "takes" the tough ones, powering them down with rapid, regular, positive action.

Favored features are its simple desgin, with all working parts exposed for easy accessibility, its sturdy construction and inexpensive operation, its easy adaptability for driving piles of all descriptions—wood, steel, concrete. It gets profit-making results operating at a medium steam pressure, delivering a moderate frequency of low velocity blows from a relatively heavy ram.

Write today for full details on this dependable pile hammer.



FORCE-FEED LOADER-Model 3 is used on such jobs as road widening and resurfacing, ditch building and cleaning, dressing slopes, loading oil mix, etc., and works as com-



panion tool for Caterpillar Motor Grader. With finger-tip hydraulic control, it provides four levers for raising and lowering feeder, moldboard, throat and conveyor. New model also features roomy operator's platform, new conveyor and throat design, positive belt alignment, more accessibility and greater loading efficiency.—Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill.

SHOVEL - CRANE - DRAGLINE . New 1½-cu. yd. shovel, crane and

dragline has boom of box-type, electrically welded steel construction with wide flaring base. Dipper handle is single unit with one-piece racking. Dipper Type 604 is equipped with independent chain crowd. When machine is working as crane it has capacity of 30 tons at 12-ft. radius. Dragline capacities are variable depending upon boom length and



nature of work. Crawler truck construction is small, dolly roller type with end drive principle. Each belt is independently driven by heavy sprocket chain, which is housed under treads. All rollers are equipped with piston-ring type seals for retaining lubricant and protection of bronze bushings. Truck base is onepiece casting with center pintle, axle supports, conical roller path and gear case cast integral. Four conical hook rollers, equally spaced, support rotating unit. Steering is accomplished with rotating unit in any position through precision air controlled clutches. Rotating frame is of welded steel construction.-Shovel and Crane Division, Lima Locomotive Works, Inc., Lima, Ohio.

Worthington-Ransome Blue Brute Distributors

See ad on page 131 for list of equipment in each line

Worthington-Ransome Distributors

Worthington-Ransome Distributors

Ala., Birmingham, Construction Equipment Co.
Montgomery, Burford-Toothaker Tractor Co.
Alaska, Anchorage, Airport Mach. & Storage Co.
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Little Rock, R. A. Young & Son
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Ark., Fort Smith, Central Welding Equip. Co. D. C., Washington, M. A. Doetsch Mach. Co. La., New Orleans, Ole K. Olson Co. Md., Baltimore, Stuart M. Christhilf & Co. Mich., Detroit, T. G. Abrams Welding, Equip. & Supply Co. N. Y., Buffalo, Murray Equip. Co. N. Y., Buffalo, Murray Equip. Co. O., Cleveland, H. B. Fuller Equip. Co. Pa., Pittsburgh, Arrow Supply Company

Worthington Distributors

Worthington Distributors

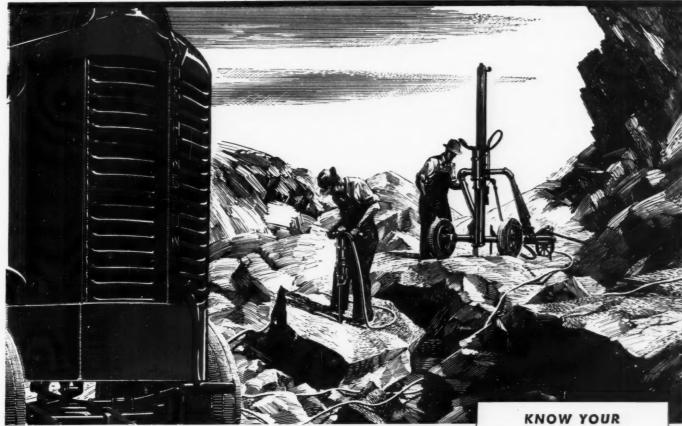
Ind., Indianapolis, Reid-Holcomb Company
La., New Orleans, Wm. F. Surgi Equip. Co.
Md., Baltimore, D. C. Elphinstone, Inc.
Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc.
Flint, Gransden-Hall & Co.
N. Y., Buffalo, Dow & Co., Ine.
New York, Air Compressor Rental and Sales
O., Cleveland, Gibson-Stewart Co.
Toledo, The Kilcorse Mach. Co.
Pa., Allentown, H. N. Crowder, Jr., Inc.
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Texas, El Paso, Equip. Supply Co.
Washington, Seattle, Star Machinery Co.
Wyoming, Cheyenne, Wilson Equip. & Supply Co

Buy Blue BRUTES

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction **Equipment Division** Holyoke, Massachusetts

TOUGH ON A LEDGE ... EASY ON YOUR LEDGER



You can make short work of the toughest rock with this Blue Brute combination. Start with the New Worthington Wagon Drill, that swings its WD-40 Drifter into action at any angle . . . a fast, powerful drilling machine with a lot of improvements that make it the most versatile performer in its field.

Follow up with Worthington Hand-Held Drills. For example, the WJ-55 . . . medium weight, yet ideal for heavy work and a clean driller at depths up to 20 feet. Your runners will like its ease of operation . . . you will appreciate its ability to cut away more footage in less time.

*Reg. U. S. Pat. Off.

orp

And for always dependable power a Worthington Portable Compressor. The 315' is typical. Engine and compressor are joined in a single housing, with three-point suspension, and both are lubricated with full force feed . . . while the easy-breathing Feather* Valves get all the air power out of every drop of fuel - gently, positively.

Tough on a ledge, these three . . . but more than kind to your ledger. Because like all Worthington Blue Brutes they're built for continuous, trouble-free service at lowest operating cost . . . one of the outstanding reasons why there's more worth in Worthington.

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis. His name is listed on Page 130.

RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Acces-

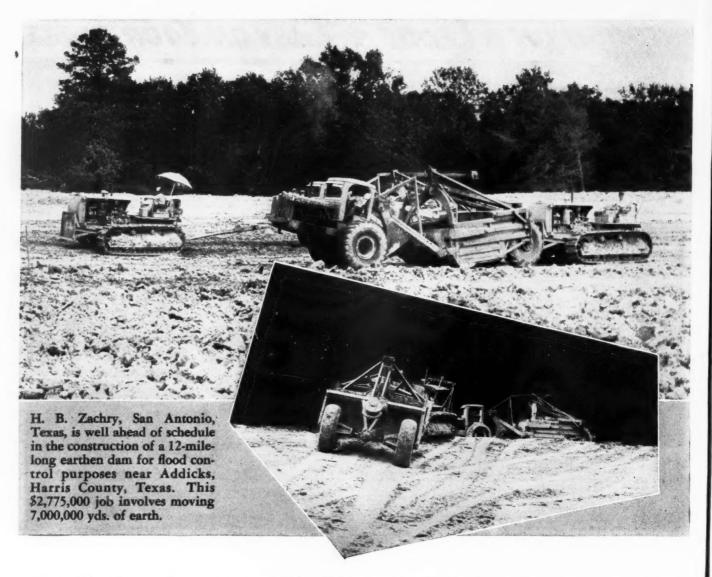
Compressors from 60 to 500 cu. ft. capacity in mountngs to suit all jobs. Rock Drills and Air Tools that have



always set the pace for easy operation a wide range of weights and sizes.



Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division



Gulf Products and Fine Service help contractor

keep ahead of schedule on big earthen dam project

"In spite of bad weather conditions, we're well ahead of schedule on this job—thanks in a large measure to Gulf products and fine service," says Perry Jefferies, Job Superintendent. "Proper lubrication and top-notch fuel performance have enabled us to push equipment to the limit without delays from mechanical troubles."

Working as a team, Gulf quality lubricants and fuels help keep contractor's equipment on the job and operating efficiently day in and day out. Added up, this kind of equipment performance means greater yardage, lower maintenance costs, and a speedier job.

Join now the list of leading contractors who

have adopted Gulf quality lubricants and fuels as basic <u>profit insurance</u>. They are quickly available to you through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.



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PNEUMATIC TIE TAMPER-Well - balanced design, evenhitting qualities, weight and coordinated valve timing make new tie tamper easy to handle. All parts are special analysis steel heat treated for their particular function. Specifica tions for Model TT-35 are: Weight, 35 lb.; weight with tamping bar, 42 lb.; length with bar inserted, 44 in.; diameter of air inlet, 1/2 in.; size of hose recommended (whip length), 34 in., operating pressure 70 to 80 lb. Standard tamping bar has 5/8 x3-in. face and is 24 in. long. Following tamping bars (plain) with 24-deg. head can be furnished as extra equipment: %x3-in. face; 11/8 x3-in. face, and 3/x5-in, face.

Tamping bar sawtooth with 3/4 x5-in. face is also available. All are 24 in. long.-Schramm, Inc., West Chester, Pa.

HEAVY-DUTY TAMPING ROLLER

-New Tamper applies 335 psi. when empty and can be used at any weight up to 800-lb. maximum. Model G-2 is designed to meet compaction requirements of such varied jobs as earth dams, airport runways and highways. Average pressure on each foot varies as follows: Empty drums, 2,350 lb.; water-filled drums, 4,000 lb.; and wet sand-filled drums, 5,660 lb. It is easy to tow and has shipping weight of only 18,800 lb.

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Oscillating-type roller consists of two 76-in. drums, designed around fullfloating pole, which allows for full individual drum oscillation. Diamond (Continued on page 134)



HIGHWAYS

CURBS

CURB AND GUTTER

SIDEWALK

AIRPORT

The heavy duty highway and airport forms have several exclusive Heltzel features . . . 21/2" tread . . . up-turned base flange — 50% additional strength ... extended lock joint guide ... hot pressed 1/4" lock joint - V type eliminates clogging . . . non-clogging single wedge stake pockets that are not affected by vibration. The base flange is also drilled for auxiliary stakes or bolting on risers. The $\frac{7}{32}$ " form is recommended for all construction up to 20' widths. The 1/4" form is recommended for construction over 20' in width. Both forms meet all highway specifications.

Heltzel also has steel forms for curb, combined curb and gutter, sidewalk, rigid radius and flexible radius.

CONCRETE CONSTRUCTION BUILDS IT BETTER

> BINS, Portable and Stationary CEMENT BINS, Portable and Stationary

CENTRAL MIXING PLANTS BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)

BITUMINOUS PAVING FORMS ROAD FORMS (with lip curb and integral curb attachments)

CURB FORMS CURB AND GUTTER FORMS

SIDEWALK FORMS SEWER AND TUNNEL FORMS CONCRETE BUCKETS

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STEEL FORM & IRON CO. FINISHING TOOLS FOR CON-WARREN, OHIO . U. S. A. CRETE ROADS

Heltzel Steel Form & Iron Company, Warren, Ohio SEND ME STEEL FORM CATALOGS: [] B-19A Steel Dual Duty | | B-19 Steel

Highway and Airport Forms

Dual Duty Airport Forms

[] A-20 Steel Forms for Curbs or Curb and Gutters or Sidewalks.

Name

Address

(Type of construction usually engaged in) HELTZEL



VIBER SLAB

THE ANSWER TO ECONOMICAL HEAVY DUTY CONCRETE HIGHWAY - RUNWAY CONSTRUCTION

The Viber Slab is a multiple-unit, full-depth vibrating attachment for finishers or spreaders. It permits the continuous and uniform consolidation of heavy-duty concrete highways and airport runways. The number of vibrating units used is determined by the width of the strip to be consolidated, and each unit is spaced for maximum, synchronized effectiveness over the entire area. The specially designed Viber vibrators maintain the unequalled high speed of 9,500 r.p.m., in concrete, which not only assures consistently fine quality of workmanship, as proven by test borings, but results in substantial savings in construction time and maintenance costs. Even the stiffest mixes of super-thick slabs can be economically vibrated fulldepth with uniform density obtained throughout. Quotation on request.



tapered feet give easiest penetration with least disturbance to surrounding material. Drums are surrounded by box-type frame, centered on the drum axle to prevent off-center loads, but pole is so mounted on each as to produce straight line pull with tractor drawbar. Each roller has stationary welded axle, supported on each end with self-aligning ball bearings, dust and dirt sealed and pressure-lubricated. Drum cleaner teeth are constructed of heavy duty channel steel. Tamper has been constructed to penetrate to bottom of soil layer and start its compaction from bottom.-Wm. Bros Boiler & Mfg. Co., Milwaukee, Wis.

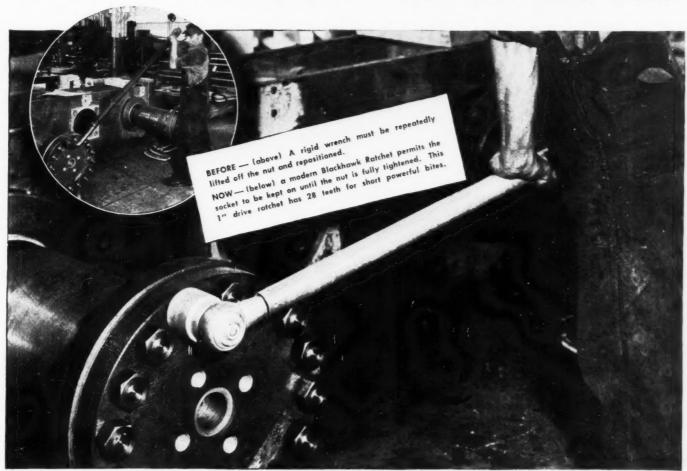
PORTABLE SAW RIGS—Four models of Bearcat portable power saws are now in production. Two basic sizes are offered, each supplied in either tilting-top or fixed-top models. Models XCO (tilting-top) rip or cut-off up to 9 in. thick with saw diameter up to 24 in. These two models require 5 to 20 hp. motors or engines. Fabricated steel tabletops are 43x54 in. Models XJR (tilt-



ing-top) and JR (fixed top) rip or cut-off stock up to 4 in, thick and use motors or engines from 11/2 to 8 hp. All four models offer weldedsteel angle frame and top construction, with chnanel steel skids. Swing cut-off mechanism operates by foot pressure on broad pedal, which swings saw through 14 in. horizontally. Special spring idler pulley design maintains even tension on belt and constant power flow to saw arbor. Arbor and idler pulleys are mounted on heavy-duty ball bearings. For ripping stock, hand wheel locks saw in any position. Details of machines are available on request for Bulletin XD-7 and D-7.-Paxson Co., Dowagiac, Mich.

HOW TO POUR BEARINGS—Wall card gives instructions to help shops to pour babitt bearings with assurance of uniformly good results.—Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80, Ill.

Here's How Blackhawk Socket Wrenches SAVE 2 HOURS A DAY on this Job



BLACKHAWK'S EXCLUSIVE COMBINATION OF FEATURES SAVE YOU TIME AND MONEY

NLY Blackhawk Wrenches combine all these features - sturdy, thin walls that let sockets squeeze into tight spots — clean, hot broached sockets for long life and less nut wear—patented thumb release Lock-On for extra safety—all the drives to serve the complete range of socket sizes—and a complete assortment of handles and accessories that build up into scores of combinations for extra utility. Ask your Blackhawk Industrial Supply Salesman for a Blackhawk wrench catalog - or write us.

A Product of BLACKHAWK MFG. CO., Dept. W2327 Milwaukee 1, Wis.



Always Specify

BLACKHAWK SOCKET



LUMBER SALVAGE TOOL — Named Bord-Pri, this new tool is used in reclamation of old lumber in razing jobs and, in tests, has proved successful in splitfree removal of sheathing, siding, flooring and other lumber, so that it remains usable for other installations. Tool lifts flooring, siding, roofing and other wood with such care that no cracks, splits or breaks occur to



lower its value. It can lift adjoining pieces of tongue-and-groove flooring and shiplapped siding with ease and damage-free care, When butted against boards to be removed, tool hugs adjacent studding and extended lips support it for positive leverage when pressure is applied to handle. Equal distribution of pressure by this leverage action lifts entire end of board, with no splitting or cracking. It is of sturdy construction, with well-balanced handle, easy-grip, tough head casting, strong lockscrew and freely pivoting, flat-surfaced face plates.—Maco Corp., Huntington, Ind.



LADDER BASE— Shur-Foot automatic leveler and locking base for ladders consists of aluminum truss that automatically levels ladder laterally on halfcircle of strong steel pipe. Abrasive shoes on ball and socket joints assure firm grip on any surface. Base requires no adjustment by workman but instantly and automatically adjusts itself to ground level and surface under either foot, levels ladder and is automatically locked in place by weight of ladder.

When ladder weight is lifted in moving, Shur-Foot is automatically unlocked for leveling at new location. Base is available for immediate shipment and is furnished in four sizes—to accommodate ladder widths from 16 to 24 in.—Akron Steel and Sales, Inc., Akron, Ohio.

Thermoid ELIMINATES GUESSWORK

Here's what you've been waiting for! Thermoid has developed and produced new, specially engineered brake linings for industrial service. The line comprises materials suitable for all types of industrial installations.

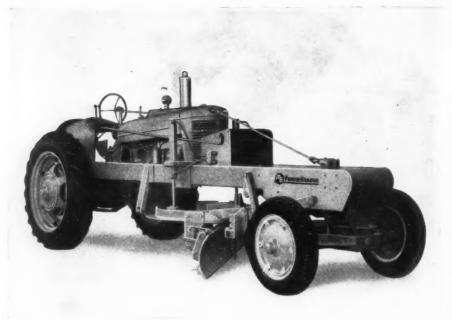
This eliminates the necessity of using incorrect lining with the resulting headaches and expense of frequent "tear-downs" and poor braking action.

Thermoid Industrial Friction Materials Distributors carry the complete line of Thermoid brake lining in roll lots. Tell your Thermoid Distributor the make and model of machine to be serviced and he is in a position to prescribe the correct type to use. For machines where modifications have been made in the brake or clutch, consult Thermoid Engineers for the proper application.

THE THERMOID LINE INCLUDES: Industrial Brake Linings and Friction Products • Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings.



Contributor to Industrial Advancement Since 1880



1000 POWER GRADER

In the new M-B Power Grader, Meili-Blumberg Corporation, makers of construction and industrial equipment for the past twenty-five years, have combined many new features around International Power to give users low cost road and street maintenance and, with the full line of attachments, an all-year tool. Check these features:

- Hydraulic power direct on moldboard gives maximum blade pressure.
- Handles all types of maintenance fast
 2 to 16 miles per hour at low cost.
- 3. All blade and attachments controlled from operator's platform.
- 4. Worm gear center-post steering for ease of operation.
- 5. Big 12 x 38 low-pressure tires turn engine power into PUSH.
- 6. Powered by big 40 H.P. International Tractor.
- Husky all-welded frame resists twisting.
- Balanced weight means easy steering, steady traction, with approximately 7500 pounds blade pressure.
- 9. Built rugged to do tough jobs.
- Attachments for every job scarifier, snow plow, bulldozer, leaning front wheels, all-weather cab.



10 TIMES FASTER THAN HAND STRIPING

Does slow, tedious hand striping make it impossible for you to keep up with today's traffic demands? Does it endanger your safety record? Then consider using M-B Street Markers. With an M-B Marker, one man stripes ten times as fast as the man marking by hand. The machine handles an all-purpose paint sprayer. Requires no experience. Hand-propelled or self-propelled models.

Complete Markers for Industrial, Street and all Highway Marking jobs. Ask for Bulletin No. 121.





MEILI-BLUMBERG CORP.

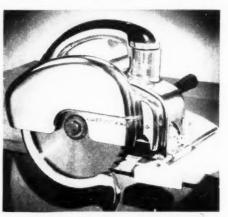
BOX CM-2, NEW HOLSTEIN, WISCONSIN



TEST PLUG— Hydro-Matic selfsealing test plug is available for standard pipe openings from ½ to 2 in. in diameter. They answer need for speedy and effective means for closing openings in tanks, boilers or other

vessels requiring hydrostatic or pneumatic internal pressure tests. —Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, III.

Streamlined and highly polished, new saw is said to deliver more power than other saws of its size, due to special General Electric motor developing 1½ hp. with direct power gear drive to 8-in. blade. Free running speed of 6,500 rpm., backed by



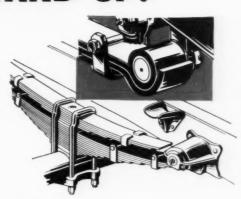
ample power, maintains cutting efficiency in all types of operation conditions. Balance torque design makes saw start smooth without jerk or jar. Among its other features is elevating mechanism, employing 20-deg. Acme triple thread screw for faster, accurate, positive adjustment of depth of cut. Ground aluminum bronze threads on elevator screw are made in No. 18 Ampco bronze. Blade will make 2%-in. straight cut and will saw 2-in. plank with 45 deg. angle cut.—American Floor Surfacing Machine Co., Toledo, Ohio.

DRAFTING PENCIL — Nordrafter pencil is simple two-part instrument consisting of aluminum body, with four-jaw collet attached and hardened, knurled steel grip. It has perfect balance with grip that allows maximum of comfort and finger ease. Four-jaw collet grip gives user positive protection against lead either slipping or breaking.—Nord Products, East Orange, N. J.



ONE big reason: FORD SPRINGS STAND UP!

Ford spring engineering provides unsurpassed endurance. Ford special alloy spring steel, with tensile strength of 200,000 pounds per square inch, assures high fatigue resistance, while deflection rates scientifically proportioned to each vehicle's gross weight assure good riding with generously ample load capacity. Long-wearing shackle bushings of steel-backed bronze reduce maintenance expense. Ford special, wrapped "safety eyes" on heavy duty front springs (illustrated) reduce stress on main leaves, afford longer life and extra safety. Hydraulic double-acting shock absorbers on light duty models further ease the ride and control the load.





ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the 100-H.P. V-8 or the 90-H.P. Six—semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (¾-floating in half ton units, full-floating in all others)—heavy channel section frames, doubled between springs in heavy duty models—big, easy-action brakes, with heavy, cast drum surfaces, non-warping and scoreresistant—extra-thick sheet metal in cabs, cowls,

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skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering. That's why FORD TRUCKS LAST LONGER... why 7 out of 11 of all Ford Trucks built since 1928 are still in service. No wonder the average age of all Ford Trucks in use is nearly 9 years! Stamina is built into them! See your Ford Dealer NOW!

FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

Look to for POWER, ECONOMY, AND EFFICIENCY

IN STATIONARY POWER AS WELL AS INDUSTRIAL TRACTORS



Model 165-4A 35/8 x 4—4 Cylinder 26 H.P. at 1500 RPM Burning Gasoline. 165 cu, in, displacement. Wt.: 1060 lbs. Model 206A-4A 35/8 x 5—4 Cyl. 38 H.P. at 1500 RPM Burning Gasoline 206 cu, in, displacement. Wt.: 1080 lbs.

Model 283-4A 4½ x 5—4 Cylinder 50 H.P. at 1200 RPM Burning Gasoline. 283 cu.in. displacement. Wt.: 1850 lbs. Model 403-4A 4½ x 6—4 Cylinder 64 H.P. at 1200 RPM Burning Gasoline. 403 cu.in. displacement. Wt.: 1950 lbs.





Model HUA 45/8 x 6—6 Cylinder 88 H.P. at 1200 RPM Burning Gasoline: 605 cu, in. displacement. Wt.: 3000 lbs;

Model 1210-12A 45/8 x 6—12 Cylinder 206 H.P. at 1400 RPM Burning Butane Gas. 1210 cu. in. displacement.





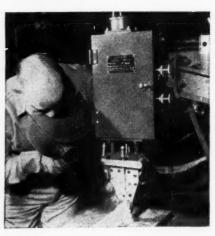
Model UTI Industrial Tractor 49 H.P. 126" Overall Length.76" Overall Width. 16' Turning Radius.

Model RTI Industrial Tractor 27 H.P. 104" Overall Length. 59" Overall Width. 12' Turning Radius.



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MINNEAPOLIS-MOLINE POWER IMPLEMENT COMPANY MINNEAPOLIS 1, MINNESOTA AUTOMATIC ELECTRODE—As in manual shielded-arc electrode, new Shield-O-Matic electrode combines all materials necessary for producing crucible-enclosed welding arc. Metallic grid construction that binds heavy flux coating to wire core provides electrode that will stand extreme flexing and bending without loss of flux and which

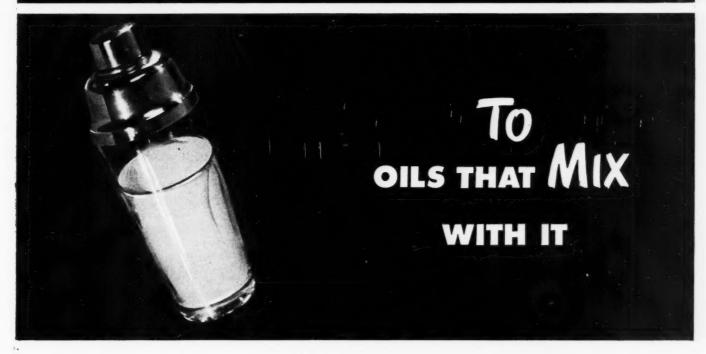


can be continuously fed into mechanically maintained arc from reel. Grid extends to periphery and welding current is conducted through heavy coating of flux to inner steel core. Finridged construction of electrode core further provides for conduction of unusually high welding currents. Its particular design causes electrode and base metal to melt at much faster rate than conventionally. Welds are exceptionally uniform.—Hollup Corp., division of National Cylinder Gas Co., Chicago, Ill.

DUCTLESS DUST COLLECTOR—Selfcontained recirculating type dust collector with large storage and suction capacity and ductless means of removing large volumes of collected dust, Model 11w50 Dustkop, consists of motor-driven suction and cleaning unit, supporting stand and two roller cams. Requiring only 8 sq. ft. of floor space, entire system can be located immediately behind source of dust. No floor or wall cutting for installation of duct work is needed. Unit is rated at 1,400 cfm. on single 6 in. inlet and will develop static suction ranging up to 7.9 in. of water on a single 4 in. inlet.-Aget-Detroit Co., Ann Arbor, Mich.

HEAVY-DUTY POWER TAKE-OFFS
—Large-scale production will be begun
in 1947 on eight standard models of
Davey heavy-duty power take-offs.
Take-off uses as its basic principle internal and external gear drive, operating as strong and durable spline.
Installation is made to rear of truck
transmission case. Eight power takeoffs are available in 50, 75 and 100 hp.
—Davey Compressor Co., Kent, Ohio.

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It is a fact that certain Shell lubricating oils separate themselves from water as though it had the plague . . . and that other oils "join up" to make remarkably stable emulsions.

It is also a fact that emulsibility is just one of the many vital factors a Shell Lubrication Engineer takes into account when he selects proper lubricants for your equipment. His stock in trade is a lubricant to meet your every need . . . his func-

tion is to select the right one for each job.

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The Hi-Way Model R Material Spreader with REVERSIBLE Transmission

Put more profits into your pockets by saving time and material. Shift one lever and you can operate the Model R Spreader forward or backwards to suit the job. Spiral feed roller and agitator-conveyor have reversible transmissions assuring positive action and steady flow of material regardless of direction. Feed gate adjustment controls thickness of spread. Width can be adjusted from one foot to full width of spreader. Entire unit is balanced for easy hook-up to truck. Swivel type self-coupling hitch allows traction wheels to remain in constant contact with ground...assures even distribution on any job. Hi-Way Model R Material Spreaders are available in 8, 9, 10, 11, 12, and 13 foot widths. Write for complete details.

Spreading is a ONE MAN job with the HIGHWAY MODEL DD



This remarkable spreader clamps onto tailgate of any dump truck. Permits one man to cast a uniform spread 8 to 60 feet wide at truck speeds up to 35 miles per hour. The DD casts material close to ground under and ahead of rear wheels of truck. It is equipped with adjustable feed gates controlling thickness and direction of spread, and throttle on 1½ H. P. Briggs & Stratton gasoline engine to control width. Material feeds into hopper by gravity—no shoveling required. The Model DD is widely used for low cost seal coat work, for spreading

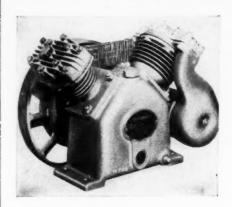
calcium chloride on gravel and dirt roads for dust control in summer, and for spreading sand and cinders on highways, streets, and airports for ice control in winter. Write for specifications.

HIGHWAY EQUIPMENT COMPANY, INC. 602 D Avenue N. W. Cedar Rapids, Iowa

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MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

AIR COMPRESSORS—New line of "Air King" air compressors includes single-stage and two-stage sizes for pressures up to 250 psi. for use with standard motors of 1 to 15 hp. inclusive. Arrangements include self-contained power driven models mounted on bases or tanks as well as bare compressors for either direct or V-belt connection to



drivers. Compressors supply air for wide variety of industrial uses such as paint-spraying, operating pneumatic controls, etc. This line introduces new principle in automatic starting of compressors. Centrifugal clutch permits driving motor to attain full speed before compressor turns. This eliminates need for starting unloaders, check valves, release and bleeder valves, etc. Direct power drive eliminates transmission losses and drive adjustments. Adequate guard incloses all moving parts.—Worthington Pump and Machinery Corp., Harrison, N. J.

CRAWLER AND WHEEL CRANES—"Smooth as steam" air-control is feature of new Type 81 shovel-crane-backhoe rig in crawler or wheel mounting. Crawler mounted machines are: Model 810, 1½ cu.yd. capacity; Model 816, 1¾ cu.yd., and Model 817, with wide treads for dragline, clamshell and crane service. Model 815 is mobilecrane



counterpart, self-propelled, one-man operated unit on 12 or 18 pneumatic tires. From control panel of short-throw levers, metering-type air valves are operated to deliver right amount of air to several required operations—hoisting, crowding, swinging, traveling and steering motions. Steering is accomplished by air taken down vertical shaft to operate steering clutches and brakes. Unit is built for rugged use with maximum safety.—The Osgood Co., Marion, Ohio.

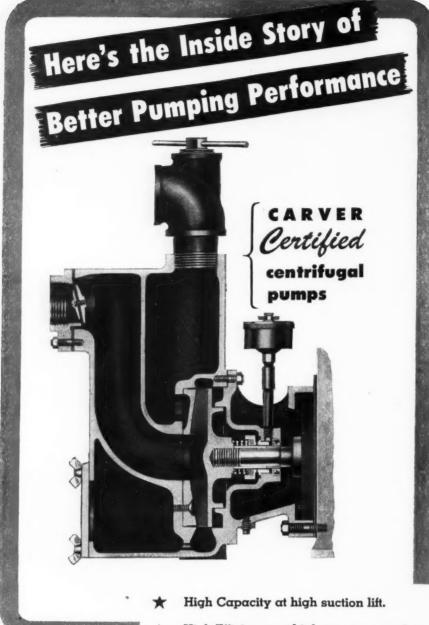
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★ High Efficiency at high pressures and at slow speeds.

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★ Life-Time Seal — wearing surfaces are almost diamond-hard.

* Fewer Working Parts because of simple design.

★ Non-Clogging — streamlined design.

* Performance of each pump is certified.

CRAWLER TRACTOR—HD-5 is 37-hp. tractor, designed to fill many needs in construction. Grease-packed truck wheels, idlers, and support rollers are serviced at the factory and thereafter require greasing attention only once every thousand hours. General Motors 2-cycle diesel engine powers new HD-5 and has unit injection, 4-way cooling and parts that are interchangeable with other Allis-Chalmers "71" series tractors. Comfortable soft cushion seat has arm rests that serve as auxiliary seats. Narrow engine cowl affords operator good view of drawbar work. Accessible controls and convenient gear shifting arrangements give five speeds forward, ranging from 1.46 to 5.47 mph, and reverse speed of 2 mph. A-frame track stabilizer design enables HD-5 to absorb shock, eliminates twisting strains and provides rigid track alignment. Choice of two different track gages, 44-in. tread (10,750 lb.) and 60-in. tread (11,-250 lb.) plus 5 ft. 41/4 in. of track on ground provide excellent ground contact, balance and traction.-Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis.

BULLDOZERS AND GRADEBUILD-ERS—Bulldozers and gradebuilders developed specially for new Allis-Chalmers 2-cycle, diesel-powered HD-5, were designed to match tractor power, size, and speed, built to maintain trac-



tor balance, stability and traction, and mounted to save wear, tear and maintenance. $HD_{7}5$ is a small tractor featuring a drawbar pull of 37.4 hp., with five speeds from 1.46 to 5.47 mph., 1,000-hr. roller and idler lubrication, full visibility for operator, and simplified maintenance.—Baker Manufacturing Co., Springfield, Ill.

GANTRY CRANE-Portability, ease in

handling and flexibility for many varied lifting services are features of new gantry crane. Of one-ton capacity with generous safety factor and minimum gantry weight, it has broad variety of uses at loading platforms and docks, in power plants and machine shops, factories and garages and for construction, maintenance and farms.—

Industrial Equipment Co., 315 N. Ada St., Chicago 7, Ill.

GPH. Sizes 1½" to 10". Ask for Bulletin 101-A. Carver Pump Co., Muscatine, Iowa.

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PARTS HARD FACED BEFORE USE HAVE UP TO 500% GREATER SERVICE LIFE



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... hard surface one part and let it do the work of two, four, or more - in farm implements, construction equipment, or any other machinery where parts are subject to impact and abrasion. A hard-surfaced plow share turns over 165 acres of sandy soil - unsurfaced in the same soil; only 12 acres.

Look at these examples of savings made possible by hard-facing new parts with Amsco rods or electrodes. Send for bulletin 941-W - it describes Amsco's complete line of conservation welding products.

AMSCO

41%+...Corn planter plows gave 41% more service when hard-faced with Amsco No.



100%+... Pugmill knives gave better than 6 davs' serv-ice when hardfaced with Ams-co Economy Hardface — gave only 3 days' service when sur-faced with other rod.



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00%+...Shovel at left sur-sced with Amsco 217 shown fter plowing 500 acres. Un-urfaced shovel at right after 10 acres.



500%+... Cast iron brick machine part gave over one year's service after hardfac-ing — ordinary service 2



Cullet pulverizer hammers protected when new by thin coat of Amsco No. 459 — polishes in service, retards wear.



199% +... Cultivator spades cultivated 185 acres after hard-facing with Amsco 459 — unsurfaced, only 62 acres.



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Corn-cob crusher rolls protected with Amsco No. 459 give better service with less repair than when coated with higher priced hard-surfacing rod.

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Jumbo Manifolds are typical of the heavy-duty jobs on which "Allgood Cord" serves so successfully. Caisson work is another "special" for this husky air hose.

Contractors know that Goodall's finest means second-tonone, in quality, reliability and long-life economy. And where safety is an added factor, any hose with the famous Cloverleaf trademark can be counted on to provide full protection to the men who use it.

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Built to insure the greatest possible resistance to high pressures; constant dragging over broken rock, track, concrete, etc.; and the blows inflicted by falling objects. It is virtually kinkproof . . . an important factor in caisson work, where a constant supply of air is a must. Regardless of the severity of the service, above ground or below, "Allgood Cord" . . . Goodall's finest large-size air hose . . . can be relied on to stay on the job longer, giving at all times the maximum of safety and economy.

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use



APRON FEED-ERS—(8-p. bulletin) Contains complete specifications on 69 available models, types and sizes of standard feeders. Feeders can be furnished without sideboards,

with straight sideboards or with flared sideboards; for drive by gear motor, by conveyor tailshaft, or by crusher. Lengths from 6 to 14 ft. are standards in widths from 30 to 48 in. Data are given on capacities, dimensions, weights and horsepower. Of special interest is information on how to order to insure right feeder for job.—Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn.

TRUCK AND BUS CLEANING MANUAL—(64-p. illustrated handbook) Outlines latest methods and materials for providing fast, thorough and economical cleaning with minimum labor with particular reference to preventive maintenance. First part deals with cleaning of motors and chassis, control and prevention of sludge, cleaning of carburetors, fuel and water pumps, with solvents of detergent action. Cleaning of cooling systems and decarbonizing dismantled parts are also discussed.—Magnus Chemical Co., Inc., Dept. CM, Garwood, N. J.

PRESERVATIVE TREATMENT—
(4-p. folder) Lists Sulco life preservers for concrete floors, masonry blocks, brick and mortar. With it is sample of water-repellent cement mixing powder.—Sullivan Co., Memphis 2, Tenn.

PACKAGED POWER UNIT—(16-p. booklet) Describes new unit with electrofluid drive, which consists of general purpose induction motor, flange-mounted to housing and hydraulic coupling.—Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

ONLY ONE WAY TO COTTECTLY TENDION A STUD OR BOLT



Snap-on TORQOMETERS

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insure accuracy — tell tension as bolt is tightened...

WHERE specifications call for accurate, uniform stud or bolt tension, Torqueters should always be used. "Guesswork" tightening is an open invitation to all the troubles that follow mechanical distortion . . . wasted power, dangerous wear, breakage of parts. Even highly skilled mechanics cannot be expected to approximate specified pressures.

With Snap-on Torqometers any worker can tighten bolts to the exact foot-pound of tension every time... and on delicate mechanisms, to the exact inch pound.

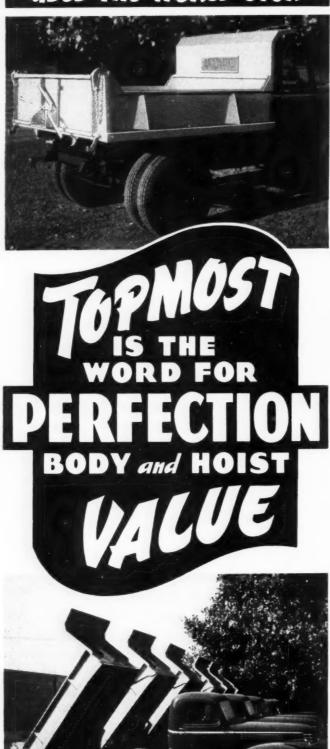
He sees the applied torque as the bolt is tightened ... as easily as reading a watch.

Everywhere in industry Snap-on Torqometers are being adopted as standard wrench equipment for precision assembly and maintenance operations. Available in a complete range of sizes from zero to 30 in. lbs., up to 2,000 ft. lbs. Send for Snap-on catalog of power and hand wrenches for industrial production and maintenance.

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THE PERFECTION STEEL BODY COMPANY
GALION, OHIO





VAPOR SAV-ING ROOF— (8-p. bulletin) Describes expansion roof and improved floating roof of doubledeck construction, with information on conservation of

petroleum products in storage. — Graver Tank & Mfg. Co., Inc., 4809 Tod Ave., East Chicago, Ind.

RADIANT HEATING—(472-p. book) Thoroughly covers complete information on design, installation, and control of hot water, steam, warm air, and electric radiant heating systems for buildings. In addition, snow melting and radiant cooling are discussed in detail. Included among 309 illustrations are 64 full-page charts for determining pipe size and spacing for as many types of floor and ceiling construction. Data resulting from author's own tests on effect of floor coverings are also included. Exact step-by-step procedure in designing and installing radiant heating systems is summarized. Author is T. Napier Adlam. Bound in imitation leather, it is priced at \$6.-The Industrial Press, 148 Lafayette St., New York 13, N. Y.

TESTING MACHINE — (Catalog page) Describes new model transverse testing machine with 10,000-lb. capacity, Model TR-1.—Steel City Testing Machines, Inc., 8843 Livernois Ave., Detroit 4, Mich.

INDUSTRIAL PROTECTIVE CLOTHING—Tells of new products in this field, pictures each garment, describes its functions in industry, and relates method of construction and materials used to guarantee maximum service.—B. F. Goodrich Co., Akron, Ohio.

WIRE ROPE—(20-p. pamphlet) Condenses and charts results of questionnaires answered by 8,339 wire rope users and customers.—Preformed Wire Rope Information Bureau, 520 N. Michigan Ave., Chicago 11, Ill.

TANDEM ROLLERS—(12-p. catalog) Gives detailed construction views and data on line of variable weight tandem rollers, as well as complete specifications.—Galion Iron Works & Mfg. Co., Galion, Ohio.

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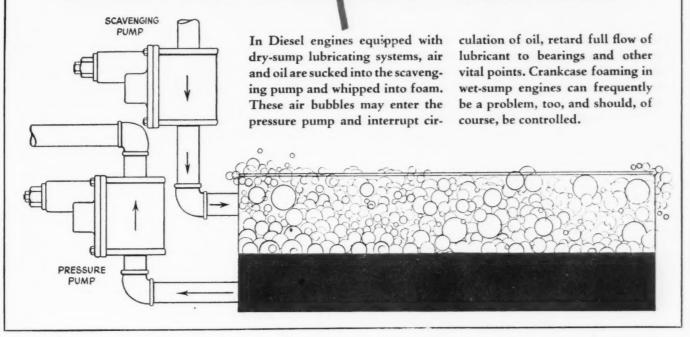
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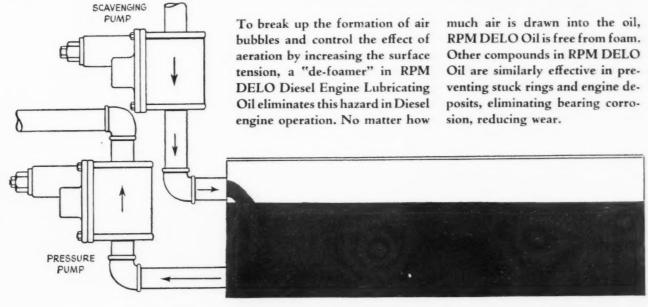
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MECHANICAL PACKINGS—(20-p. catalog) Contains information on service applications as well as construction and performance features of most widely-used Paimetto Packings. These include self-lubricating, molded, sheet, and other special purpose types. It also contains application chart.—Greene, Tweed & Co., North Wales, Pa.

STEEL FORMS—(Two 4-p. folders) Describe steel forms for house and building foundations and for concrete walls and roofs.—Irvington Form & Tank Corp., Irvington, N. Y.

TRUCKS—(Illustrated folder) Describes line of 5-ton trucks, with photographs of sample jobs.—Four Wheel Drive Auto Co., Clintonville, Wis.

HYDRAULIC HOISTS AND BODIES—(Catalog collection) Contains eight folders illustrating and describing Models 626 and 721, 626 and 726, HD-7 and HD-8, HD-10, 736, 840 and 7740, A-standard and B-heavy-duty, custom-built models, and hydropaka. — Marion Metal Products Co., Marion, Ohio.

ANTI-RUST PAINT — (Illustrated folder) Presents complete application directions and emphasizes that Rustrem can be applied directly over rusty surfaces without brushing or scraping. Representative uses are listed in detail.—Speco, Inc., 3142 Superior Ave., Cleveland, Ohio.

POWER—(32-p. bulletin) Presents equipment available for power generation and distribution, ranging from steam and hydraulic turbines, turbo generators, engine type generators and condensers and auxiliaries to pumps, water conditioning, motors, motor control, switchgear, circuit breakers, power and distribution transformers and unit substations.—Allis-Chalmers Mfg. Co., 708, Milwaukee 1, Wis.

MAGNETIC PULLEYS—(Catalog 303) Contains descriptive data, specifications, information on selecting for proper size, material, capacities, trajectory charts, and use of double magnetic pulleys, as well as application suggestions and pictures.—Stearns Magnetic Mfg. Co., Milwaukee 3, Wis.





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EYE PROTECTION—(8-p. bulletin) Describes in detail chippers' goggles, with protective lenses, chemical goggles, open-frame Ful-Vue spectacles, spectacles with side screens and leather side shields, dust goggles, Dreadnaut goggles, welders' goggles, foundry and melters' goggles, acetate spectacles, gas goggles, wire screen goggles, and specially designed goggles for workers who must also wear corrective glasses.—Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.

EARTHMOVING — (12-p. folder) Covers wide range of Tournapull applications, with action photographs and factual caption-type job descriptions. Projects covered range from general earthmoving, construction, mines, pits, quarries and railroads to applications in industrial, agricultural and oil fields.—R. G. LeTourneau, Inc., Peoria, III.

FLAME CUTTING—(4-p. bulletin) Describes company's facilities for producing plain and intricate shapes from steel plates. Typical flame cut sections are shown, along with information regarding use of irregular shaped steel plates in both production and maintenance work.—Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, III.

AXONOMETRIC DRAWING—(20-p. illustrated booklet) Explains fundamentals of three-dimensional illustration and its advantages. Ten cents a copy.—Instrumaster Industries, Inc., Arch St., Greenwich, Conn.

SAND BLAST HOSE — (Catalog leaflet) Describes construction of product and gives data on sizes, weight per hundred feet and outside diameters.—The B. F. Goodrich Co., Akron, Ohio.

PORTABLE PLANT—(8-p. bulletin) Describes new, small, portable crushing and screening plant called Pitmaster Straightline.—Iowa Mfg. Co., Cedar Rapids, Iowa.

JACKS—(4-p. bulletin) Describes Simplex Util-A-Tool and pictures it in many operations.—Templeton, Kenly Co., 1020 S. Central Ave., Chicago 44, Ill. etin)
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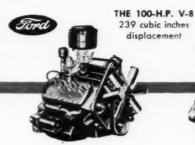
automotive mechanics are thoroughly familiar with Ford engines. Ford economy is famous. And Authorized Ford Service is available in every community of any importance.

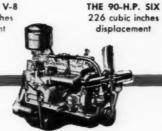
Certainly, then, if your power requirements come within the range of 40 to 100 horsepower, you could not choose an engine which would offer you as many positive advantages as Ford.

Three Ford-built engines are now available, as shown below. You can buy them singly or in quantity, through any Ford Dealer or from Ford Motor Company. For detailed specifications and dimensional data, write—

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THE 40-H.P. FOUR

119.5 cubic inches

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FOR INDUSTRIAL AND MARINE POWER





CONDITIONING WATER-(60-p. bulletin) Describes many different types of water conditioning processes and explains applications, advantages and limitations of each. Included are tables listing various kinds of gaseous and solid impurities, showing effects, limits of tolerance for various purposes, methods of removal and residual amount of each impurity after treatment. Comparison chart shows chemical results produced by various water treatment methods. Illustrations show diagrammatically principles of construction and operation of various processes and equipment for softening, clarification and demineralizing of water and other liquids.-Liquid Conditioning Corp., 423 W. 126th St., New York 27, N. Y.

DRAINAGE PRODUCTS—Entitled "Planning Small Bridges with Toncan Iron Drainage Products," booklet contains detailed charts and tables of dimensions and design properties of iron sectional plate and sectional plate arches, and numerous illustrations and descriptions of applications of company's products to small bridge design.—Toncan Culvert Manufacturers Association, Film Building, East 21st St. and Payne Ave., Cleveland, Ohio.

PIPE FITTINGS—(20-p. catalog) Contains complete application information, structural data, installation procedure, temperature-pressure rating charts, specifications and list prices of fittings for making full pipe strength, permanent, leakproof branch pipe outlets. It also illustrates and describes drain out fittings and complete line of flanges.—Bonney Forge & Tool Works, Allentown, Pa.

EXHAUST FANS—(16-p. catalog) Contains helpful information on where and how to use exhaust fans, how to determine size fan required and types and methods of installation. Details of design, construction, specifications and performance data are given for direct-drive and belt-drive fans and accessories for commercial and industrial use.—Emerson Electric Mfg. Co., St. Louis 21, Mo.

DOORS—(60-p. catalog) Illustrates and describes complete door service for industrial and commercial buildings.—Peelle Co., Inc., Stewart & Flushing Aves., Brooklyn, N. Y.

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They are your assurance, too, of longer life and greater efficiency for your machines plus a saving of time and money.

Shown here are four of the pieces in the new line. For additional information on any lubrication problem, drop a line to Alemite, 1840 Diversey Parkway, Chicago 14, Illinois.



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Alemite Lever Guns . . . equipped with a loader valve which permits rapid and positive refilling of guns without disassembling and without mess or waste. High pressure (up to 10,000 lbs.) makes it possible to serve difficult bearings with the minimum of manual effort. Built to famous Alemite standards of ruggedness and long

Alemite Loader Pumps ... the one shown is used to fill hand guns from original 100-lb. lubricant drum. (Also available in 35-lb. capacity container.) The loader prevents air pockets in the gun, which result when hand and paddle methods are used. It ends waste and contamination of lubricants. It saves time, eliminates handling of lubricant.





Alemite Volume Pumps . . . Designed for track roller and idler bearing lubrication, and all points requiring a volume of lubricant. Pump has a capacity of 35 lbs. It develops 3500 lbs. pressure. Easily pumps all grades of light-bodied or semisolid lubricants that seek their own level. Protects lubricant from dirt and

Alemite High Pressure Pumps . . . Air operated for power lubrication when extensive lubrication needs make manual methods impractical. Handle a volume delivery of heavy fibrous lubricants even at low temperatures. Worm feed assures positive volume delivery of lubricant at high pressure.



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The JACKSON Paving Tube is perfectly adaptable to slabs 6" to 24" thick, without affecting the efficiency on single or two-course standard plain or reinforced concrete pavement construction and may be quickly adjusted from 10' to 25' widths in the field. Power Plant mounted on the Finisher has ample reserve power through entire frequency range of 3000 to 5000 VPM. Finger tip controls. Quickly and easily attached to any standard finisher—and can be attached to the rear of standard spreaders to advantage for vibrating the first course in thick slab construction. One of the best investments in equipment a paving contractor can make. See your Jackson distributor or write for further information.

Manufactured by ELECTRIC TAMPER & EQUIPMENT CO. for JACKSON VIBRATORS, INC. LUDINGTON, MICH.

HOSE COUPLING—(20-p. pocket-size handbook) Is planned to aid user of hose and hose couplings in reducing operating costs and increasing efficiency of his equipment. Valuable hints and information on care of hose, selection and installation of correct hose couplings for various types of equipment as well as other useful data, is presented in clear, easy-to-use form.—Hose Accessories Co., 2702F N. 17th St., Philadelphia 32, Pa.

POWER TRANSMISSION AND CONVEYOR — (General Catalog) Gives complete descriptions, data and prices for many nationally known lines of speed reducers, gears, belts, chain drives, bearings, flexible couplings, pulleys, electrical motors, power and gravity conveyors and items distributed by this company. —Patron Transmission Co., 120 Grand St., New York, N. Y.

WIRING—(12-p. catalog revision) Describes and illustrates 4x4 Wirewa, enclosed metal duct for housing and protecting electric wires and cables. Photographs and schematic drawings of all component parts of wireway are included.—National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa.

LOADER—(8-p. folder) Features improved model for high-speed, low-cost loading of large hauling equipment. Profusely illustrated, it contains much technical information and specifications for Model BV loader.—Euclid Road Machinery Co., Cleveland 17, Ohio.

BUCKET SELECTION—(48-p. catalog) Presents company's two-line buckets in manner which makes it easy for prospective user to make his own selection. Combination of pictures and factual data enables bucket user to coordinate his crane capacities with data presented and select exactly the right bucket for rehandling, hard digging, or dredging.—Blaw-Knox Co., P.O. Box 1198, Pittsburgh, Pa.

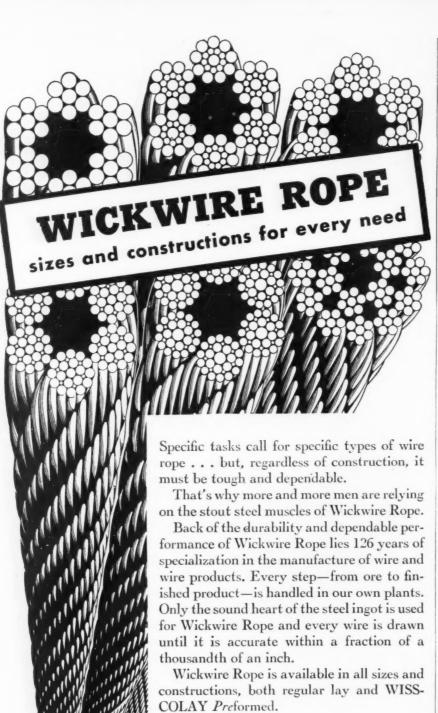
SOIL STABILIZER — (Illustrated bulletin) Describes new single pass soil stabilizer, designed to make use of on-the-spot materials in building sub-grades, secondary roads, airports, etc.—Harnischfeger Corp., Milwaukee 14, Wis.

Super Service ON ALL TYPES OF JOBS!

5 and 10 TON 1/2 and 3/4 Yard **EXCAVATORS** CRANES RANE & SHOVEL Every UNIT is FULLY CONVERT Regardless of whether your job calls for a shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller, a UNIT machine easily "fills the bill"! For UNIT is convertible to ANY attachment and gives an excellent account of itself on ALL types of service. The change from one attachment to the other can easily and quickly be made on the job, by any ordinary mechanic. UNIT exclusive features include: Automatic traction brakes...Disc type clutches...One-plece cast gear case and above all, UNIT's safety-promoting FULL VISION CAB.

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TUNNEL FORMS—(8-p. file folder) Describes and illustrates traveling steel forms for tunnels, sewers, conduits and walls, and special tunnel equipment—shields, air locks and jumbos.—Robert S. Mayo, Construction Engineer, Lancaster, Pa.

TRUCK TRANSPORTATION—New plan, termed "Continuing Control System of Truck Management," presents detailed system for increasing transportation efficiency of all owners of motor trucks. Complete instructions and material for putting system into effect are available.—The White Motor Co., Cleveland 1, Ohio.

SODA ASH—(64-p. bulletin) Contains chapters on properties of Soda Ash, bulk shipments, storage, conveying and elevating, unloading of bulk, unloading of bags and barrels, weighing, proportioning and feeding devices, sampling and analysis, precautions and conversion tables.—Solvay Sales Corp., 40 Rector St., New York 6, N. Y.

PROTECTIVE PAINTS—(8-p. bulletin) Describes penetration, protective paints that are said to cut practical painting time from hours to minutes. Products covered include rust preventive oil paint, aluminum paint, enamel, and rubber coats.—Wilbur & Williams Co., Greenleaf & Leon Sts., Boston 15, Mass.

PORTABLE LIGHTING AND POWER UNITS—(4-p. booklet) Contains complete specifications for floodlight, searchlight, combination and beacon models.—Davey Compressor Co., Kent, Ohio.

SOIL-CEMENT—(12-p. bulletin) Is designed to give public officials essential facts about use of soil-cement for light traffic roads and streets. Projects in 26 states are illustrated and described. — Portland Cement Assn., 33 W. Grand Ave., Chicago 10, Ill.

protective packaging—(12-p. brochure) Outlines uses and advantages of "Cocoon," new process for packaging anything from ball bearing to locomotive.—R. M. Hollingshead Corp., Camden, N. J.

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ICKERS Hydraulic Power Steering

Vickers Hydraulic Power Steering requires minimum space and can be located where it does not interfere with other apparatus. In nearly all cases it is easily applied to existing vehicle design with only a few simple alterations.

The hydraulic power cylinder is connected to the drag link at one end and the chassis frame at the other; it is controlled by the pitman arm. The existing steering gear is not altered. Hence, Vickers Power Hydraulic Steering is easily applied either as original or as optional equipment.

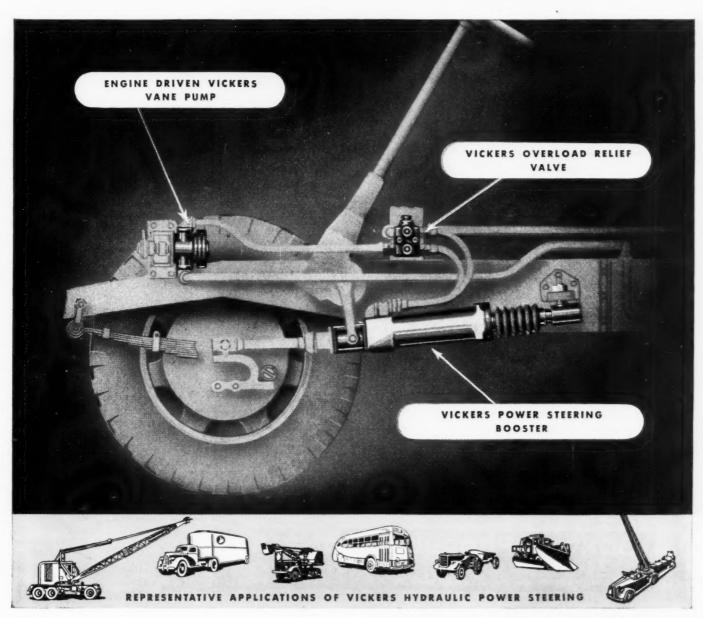
Steering is finger-tip easy—instantly responsive—and no road shocks can get to the steering wheel. Overload

protection and lubrication are both automatic. Fifteen years of successful operation on trucks, buses, and road machines have proved the value of Vickers Power Hydraulic Steering. Write for Bulletin 44-30.

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PREFABRICATED LAMINATED FIBRE TUBING FOR PIER AND COLUMN FORMS



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These columns, formed for the plant of a paper company, are 21' high. Certain of these columns have steel support braces set-in at one story height, to carry steel beams for supporting a second floor. Contrast the speed and economy of the SONOTUBE method with the building of square wooden forms to achieve a similar result. SONOTUBES are available in lengths up to 24' . . . and are easily cut by hand saw on the job to exact column height.

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PROTECTIVE SYNTHETIC COAT-ING-(4-p. folder) Gives properties, application data and typical uses of Ucilon, which is said to be specially advantageous for maintenance work and for products subjected to corrosive service.-United Chromium, Inc., 51 East 42nd St., New York 17,



REMOTE INDI-CATING AND CONTROL SYS-TEMS — (12-p. engineering bulletin) Tells how transmitter, receiver and indicator of remote indicating and control systems are constructed

and how they work. Their impor-tant advantages and specifications are graphically presented with photos, diagrams and charts.-Allis-Chalmers Mfg. Co., Milwaukee 1,

CONCRETE MAINTENANCE—Concrete maintenance is timely and important subject of current issue of The Trowel. Discussing causes of concrete disintegration and how to make successful repairs, this 12-p. bulletin contains practical information on bridge maintenance, increasing useful life of concrete floors by "Armorplating," controlling shrinkage in machinery grouts, building restoration, repairing hydraulic structures, repairing railroad structures, waterproofing grain elevators and sewage treatment plants, and protective sealing and decorating concrete and masonry surfaces. Much information is presented pictorially.-The Master Builders Co., Cleveland 3, Ohio.

ROOF CONSTRUCTION—(Two catalogs) Shurebond unit system of concrete joist construction is described in 32-p. catalog, while 12-p. bulletin gives data on Metrodeck, metal roof deck with tapered rib. -Goldsmith Metal Lath Co., Cincinnati 2, Ohio.

PERFORATED METALS — (128-p., illustrated catalog) Describes and illustrates types and sizes of perforations, including round, square, square-round, diamond and slot Screens and fabricated metals are also covered. Numerous tables furnish useful information.—Hendrick Mfg. Co., Carbondale, Pa.

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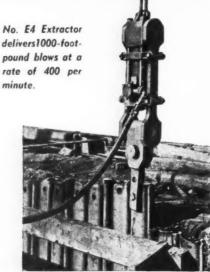
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Two cates of is denile 12-p. etrodeck, ered rib.

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Embodying similar mechanical principles to those of McKiernan-Terry Double-Acting Pile Hammers, these ruggedly built extractors provide exceptional pulling power, with the sharp energy of blow needed to vibrate and loosen stubbornly set piling. Connect with pile quickly, place it just where desired after extraction, disconnect easily. Two standard models—heavy and extra heavy.



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Full information, specifications, photos, etc. Ask for Bulletin No. 55.

McKIERNAN - TERRY CORPORATION

Manufacturing Engineers

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New York 7, N. Y.

SCRAPERS — (Three-color broadside) Stresses specifications and production features of new model scrapers, which are matched in capacity to power of manufacturer's diesel-powered tractors and built to perform with them as complete earthmoving package.—Caterpillar Tractor Co., Peoria 8, III.

A.C. WELDERS—(Illustrated booklet) Contains construction details, electrical specifications and application data on complete line of a.c. transformer type welders. Electrical specifications and performance data are presented in chart form. General application information concerning recommended electrodes is also included. — Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.

WELDING AND CUTTING—(64-p. catalog) Is divided into two sections—one for oxyacetylene welding and cutting gases, equipment and supplies; the other for arc welding machines, accessories and electrodes. Ten pages give specially compiled electrode price lists.—Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

PANEL HEATING—(Manual) Entitled "Automatic Control of Radiant Panel Heating," book contains diagrams, charts and photographs, together with information on use of graphs for determining required performance of heating installation under control. — Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

OFFICIAL DESIGN STANDARDS-

(40-p. booklet) "Specification for the Design of Light Gage Steel Structural Members" covers results of studies begun in 1939 at Cornell University. It consists of design provisions governing shapes made up of flat or straight elements such as are most commonly encountered in design of structural members formed of light-gage steel. Endeavor has been made to simplify design procedure by including design tables, curves and charts, also illustrative examples. Specification has four appendices which deal with problems of application. Other features are: Material qualifications, design procedure for stiffened elements, also minimum properties for edge stiffeners and maximum allowable ratios of width to thickness.—American Iron & Steel Institute, 350 Fifth Ave., New York 1, N. Y.

THERE'S A HERCULES

ALABAMA—BIRMINGHAM: Aronov Auto Supply Co., Inc., 420 S 21st St. MOBILE: Betbeze, 610 St. Anthony. MONTGOMERY Jake Aronov Auto Parts & Tire Co., Cor. Bell & Whitman Sts.

ARKANSAS—LITTLE ROCK: G. L. Turner, Inc., 320 E. Markham 51. MEMPHIS, TENN.: Dealers Truckstell Sales, Inc., 365 S. Parkway, W.

CALIFORNIA—LOS ANGELES: General Truck Equipment Co., 746 S. Central, OAKLAND: A. Pasteris Co., 2200 Wood St.

COLORADO—DENVER: The Colorado Builders' Supply Co., 324 S. Broadway.

FLORIDA—JACKSONVILLE: Clark Equipment Inc., 1839 Main St.
GEORGIA— ATLANTA: (COLLEGE PARK) Carley Trailer & Equipment Co.

IDAHO-TWIN FALLS: Twin Falls Equipment Co., 251 Main Ave.,

ILLINOIS—CHICAGO: Voltz Bros., Inc., 2520 Indiana Ave. PEORIA: A. W. Moore, 2710 S. Addoms St. BETTENDORF, IOWA: Standard Wholesale Co., 1523 State St. ST. LOUIS, MO.: Truck Equipment Co., 511 N. Channing Ave. EVANS-VILLE, IND.: Hercules Body Co., Inc.

INDIANA—EVANSVILLE: Hercules Body Co., Inc., FORT WAYNE: Peerless Manufacturing Co., 4227 Bluffton Rd. INDIANAPOLIS John Guedelhoefer Wagan Co., Inc., Kentucky Ave., of Georgia Ave. LOUISVILLE, KY.: J. Edinger & Son, 1010 Story Ave. CINCINNATI, O.: The Bode-Finn Co., 2630 Spring Grove Ave.

IOWA—BETTENDORF: Standard Wholesale Co., 1525 State St. CEDAR RAPIDS: E. Cohn & Sons, Inc. SIOUX CITY: Barton-Stephens & Co., 1909 E. Fourth St.

KENTUCKY—LOUISVILLE: J. Edinger & Son, 1010 Story Ave. HUNTINGTON, W. VA.: Huntington Truck Equipment Co., 3004 Third Ave. EVANSVILLE, IND.: Hercules Body Company, Inc. CINCINNATI, O.: The Body-Finn Co., 2650 Spring Grove Ave.

LOUISIANA—NEW ORLEANS: Magnolia Equipment & Security Corp., 900 Jefferson Hwy. SHREVEPORT: Dealers Truck Equipment Co., Inc., 1561 Texas Ave. MEMPHIS, TENN.: Dealers Truckstell Sales, Inc., 365 S. Parkway, W.

MARYLAND—BALTIMORE: United Truck Equipment Co., 1242 S. Paca St.

MASSACHUSETTS—CAMBRIDGE: Hercules-Campbell Body Co., 130 Brookline St.

MICHIGAN—DETROIT: Waggy-Hoffman Equipment Co., 14089 Schaefer Hwy. CHICAGO, ILL.: Stahmer Supply Co., 135 S. LaSalle St.

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MONTANA—BILLINGS: Western Construction Equip. Co., 505 N 24th St. MISSOULA: Western Construction Equip. Co., 218 W Pine St.

NEBRASKA—LINCOLN: Highway Equip. & Supply Co., 21st & N Sts. SCOTTSBLUFF: Colorado Builders Supply Co., 602 W. 27th St.

NEW MEXICO—ALBUQUERQUE: The Harry Cornelius Co., 1510 N. Second St.

NEW YORK—BUFFALO: Truckstell-Wilcox, Inc., 224 W. Utica St TARRYTOWN: Hercules-Campbell Body Co., Inc. WATERLOO. Hercules-Campbell Body Co.

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OKLAHOMA—LAWTON: Tompkins Auto Salvage Co., 917 S. Second St. OKLAHOMA CITY: 1801 N. E. Ninth St. TULSA: The Diesel Power Co., 4th & Elgin Sts.

OREGON—PORTLAND: Newell Truck Equipment Co., 316 N. Russell St.

PENNSYLVANIA—ALTOONA: Brumbaugh Body Co., 100 Plank Road. ERIE: The Trailmobile Co., 1223 Walnut St. LEBANON: M. A. Brightbill Body Works, E. Cumberland St. at 7th Ave. PHILADELPHIA: Eastern Body Co., 31st & Fletcher Sts. PITTS-BURGH: Hercules-Pittsburgh Body Co., 1717 Mary St., S. S.

SOUTH CAROLINA—COLUMBIA: South Carolina Equipment Co., P. O. Box 295. *

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TEXAS—DALLA6: Truck Equipment Co., 2409-11 Commerce: FORT WORTH: Truck Equip. Co. HOUSTON: McArthur Welding & Fress Co., 5325 Clinton Dr. SAN ANTONIA: Potten Machinery Co., 1318 N. Alamo St. CORPUS CHRISTI: Truck Equip. Co., 1501. Port Ave.

UTAH-SALT LAKE CITY: Hercules Body Sales Co.

VIRGINIA—NORFOLK: A. S. Drumwright & Co., 1921 Brambleton Ave. RICHMOND: Crenshaw Equipment Co., Inc., 304 E. Main St.

WASHINGTON—SEATTLE: Allied Trailer & Equip. Co., 1331 Third Ave.

Ave.

WEST VIRGINIA—BLUEFIELD: Truck Equip. Engineering Co., P.
O. Box 387. CHARLESTON: West Virginia Tractor & Equip. Co.,
P. O. Box 473. CLARKSBURG: West Virginia Tractor & Equip.
Co., 100 Wood St. HUNTINGTON: Huntington Truck Equip.
Co., 919 Sixth Ave.



EQUIPMENT MEN

and Their Companies



R. G. LeTourneau, Inc., Peoria,
Ill., recently announced the final
step in their program to create an
international distribution organization. The
corporation status of the export
organization has
been elevated to

that of a full division, under the managership of Paul E. Fulford, located in New York, N. Y. Where the export department was formerly responsible solely for sales, the newly created export division will conduct all export functions including sales, service, credit, collections, merchandising, parts, installations, market research, field engineering, forwarding, etc.

Formation in Seattle of a Western division to supervise continually expanding operations on the Pacific Coast has been announced by Monsanto Chemical Co., St. Louis, Mo. The new operating division, consists of four plants which were the principal units of I. F. Laucks, Inc., for the manufacture of plywood glues, paint and wood preservatives. One plant is situated at Los Angeles, Calif., and major plant sites are situated at Seattle, where a \$2,000,000 three-year construction program is scheduled to start next spring. Included in the Division are plants at Lockport, N. Y., and Portsmouth, Va.

Luke H. Sperry, a member of the board of directors and director of engineering for the Hercules Powder Co., retired Dec. 31. He was chief engineer for the past seven years.

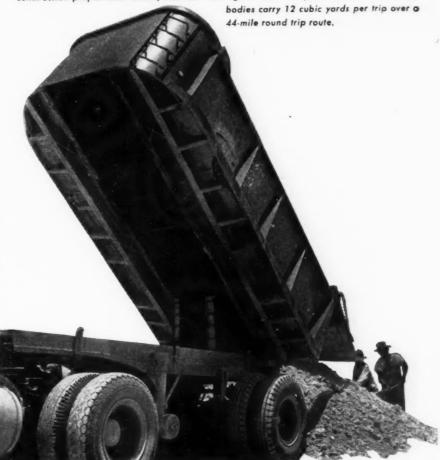
Harvey T. Gracely has been elected president of the Marion Power Shovel Co., Marion, Ohio, after serving the company in various capacities for many years.

Protected Steel Products Co. has recently changed its name to Plasteel Products Co.

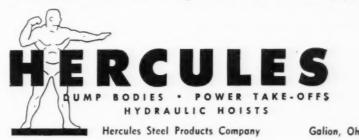
FOR HALF THE COST



Part of the fleet of Hercules Huskies operated by the R. B. Tyler Company on a road construction project near Miami, Florida. Working 24 hours a day, these semi-trailer dump



On the big hauling and dumping jobs, one Hercules Husky does the work of two standard size dump trucks. That's a 50% savings in direct labor costs right there. Better still, you can add the savings on fuel, tires and maintenance, made possible through FEWER trips with LARGER loads. Logical? . . . you bet it is! Check the list on the opposite page for your nearby Hercules distributor and ask him to show you the facts and figures about the Hercules HUSKIES . . . designed and built for the big jobs.



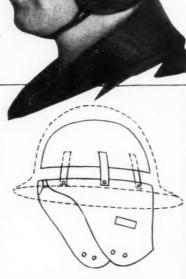


M·S·A Minter Linings

for SKULLGARD HATS and CAPS

Here is warm, snug-fitting neck and ear covering for men on out-door construction jobs—added to the time-proved head protection of M.S.A. Skullgards! Wind-proof, waterproof, in or out in a matter of seconds, the M.S.A. Winter Lining keeps out rain, snow, and icy winds—provides warmth and comfort in spite of inclement weather—is made in two sizes to fit all Skullgard protective hats without alteration of any kind, and without change in head size.

Made of heavy genuine Greyfall cloth, closely-woven and warmly lined, the Winter Lining conforms smoothly to the wearer's head—is drawn snug by laces or chinstrap. Bulletin DK-9 gives complete details.



EASY TO INSTALL OR REMOVE

The M.S.A. Winter Lining consists of a skullcap fitted with three short tabs and a lined earlug section. To install, simply place skullcap in crown of hat and bring tabs down between sweatband and hat wall. Earlug section is then fastened to the tabs by means of snaps. The sweatband is not removed.



MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS . PITTSBURGH 8, PA.

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Acquisition by the M-R-S Manufacturing Co. of a new and larger site for the manufacture of Mississippi wagons was announced when title to a part of the Mississippi Ordnance Plant at Flora, Miss., was formally transferred to the company by the Reconstruction Finance Corp. The deeded property consists of 406.13 acres of land and eight buildings with a total of 79,000 sq.ft. of floor space, including a modern plant structure of 52,400 sq. ft. and an office building of 12,500 sq.ft. It is situated 23 mi. north of Jackson.

Le Roi Co., Milwaukee, Wis., announces the appointment of E. Carl Price, Newburgh, N. Y., as exclusive distributor for the New York counties of Orange, Rockland, Sullivan and Ulster. Mr. Price has been in business in Newburgh for the past thirteen years and will represent Le Roi in its entire line of products.

C. Huizing has been named New England representative for the Watson-Stillman Co., Roselle, N. J., dealers in forged steel fittings, valves, wire rope shears, hand pumps, jacks, etc. He was formerly in their sales department as sales engineer and has been with the company five years.

RAPID!



Junior Model with Horizontal Frame Attachment.

Will break 15 inch reinforced concrete walls up to 10 feet high. Frame attachment can be removed and boom tipped up to vertical position for breaking all types of payement.

Ask about our

HEAVY-DUTY TYPE

R. P. B. CORP. MFR'S. of RAPID PAVEMENT BREAKER MACHINES

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Thousands of dollars for this Crane -but it can't work!

• This crane erected on the job cost \$41,000. But it can't do a nickel's worth of work until rigged with wire rope costing a fraction of that amount.

The wire rope used makes a big difference, yet for this job <u>Preformed Wire</u>
Rope of Improved Plow Steel . . . the best there is . . . costs only about \$300.

<u>Preformed permits faster, better work, with fewer shutdowns.</u>

Management likes <u>Preformed</u> because it lasts longer. Workmen like it because it's easier and safer to handle. Get the most out of your machines by specifying <u>Preformed</u> of Improved Plow Steel.

Send for free copy of informative book about Preformed. Address: Preformed Wire Rope Information Bureau, 520 N. Michigan Ave., Chicago 11.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

HANDLES EASIER - LASTS



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For built into every CLEVELAND are just exactly those features required to assure peak performance in all types of soil and terrain, including such pioneered CLEVELAND features as

Unit Type Construction • Transmission Controlled Speeds • Flush
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THE CLEVELAND TRENCHER CO.





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SALES REPRESENTATIVE

MERCER-ROBINSON COMPANY, INC. 30 CHURCH ST., NEW YORK 7, N. Y.

American Brake Shoe Co., New York, N. Y., announces the appointment of Homer Parsons as assistant director of exports. Mr. Parsons, who has had 19 years' experience in the export field, has been a sales representative for Brake Shoe's export department since August 1945.

Kaiser Co., Inc., Iron and Steel Division, Oakland, Calif., announces the appointment of C. F. Borden as assistant general sales manager and R. L. Asquith as product sales manager, tubular and specialty products. Jack L. Ashby, general sales manager of Kaiser Steel, will continue as Oakland district sales manager in addition to his new responsibilities.

Marquette Cement Manufacturing Co. will soon open a sales office in St. Louis to serve Missouri, southern Illinois and southern Indiana. The new office, will be headed by Harry C. Shields, who has been appointed sales manager for that district. Kenneth F. Hackmann has been appointed his assistant in the St. Louis sales office.

The Lincoln Electric Co., Cleveland, Ohio, announces the appointment of seven new welding sales engineers: Marvin Anderson, appointed to the Moline, Ill. office; Albert Bavaria, Philadelphia office; Richard Freundlich, Cleveland sales office; Paul Holden, Franklin, Pa., sales office; Richard Nelson, Syracuse, N. Y. office; Richard K. Reynolds, Detroit office.

Dr. Warren L. McCabe, currently head of the chemical engineering department, Carnegie Institute of Technology, Pittsburgh, Pa., will become director of research for The Flintkote Co. on Feb. 1, 1947. In adition to many authoritative articles, Dr. McCabe is co-author with W. L. Badger of "Elements of Chemical Engineering" (McGraw-Hill Book Co.).

Charles F. Codrington has been promoted from assistant to the manager to sales manager of the blower and compressor department of the Allis-Chalmers Mfg. Co., Milwaukee, Wis. Mr. Codrington joined Allis-Chalmers' graduate training course in 1930 and served in the engine and condenser department for some time before becoming associated with the blower and compressor department in 1935.

Gypsum Association announces removal of its offices to 330 South Wells St., Chicago 6, Ill.

Whats in it,

In this special machine there's plenty for you as a user of industrial lubricants. With the modern Refractometer, Sinclair Laboratory specialists keep posted on what's in your industrial lubricants. It shows them what properties to strengthen, so the finished product will perform best in any specific application.

Index of refraction and specific dispersion, determined by the Refractometer, is a measure of the chemical structure of lubricating oils. By use of such instruments as the Refractometer, Sinclair maintains important control points in the manufacture of dozens of industrial lubricants.

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Such laboratory research and control gives you assurance that Sinclair lubricants are made correctly to provide the kind of special protection your valuable machinery requires. Sinclair Automotive Lubricants

For Engines:

OPALINE MOTOR OIL OPALINE TBT MOTOR OIL (For severe service)

TENCL (Heavy Duty — For Diesels)

For Gears:

OPALINE GEAR LUBRICANTS

For Chassis:

OPALINE CHASSIS LUBRICANT

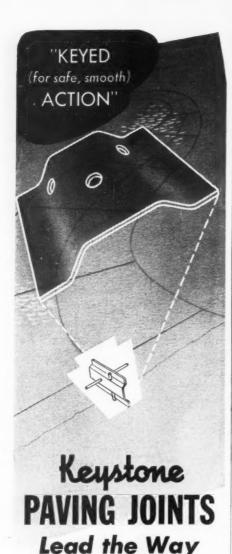
For Wheel Bearings:

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SINCLAIR REFINING COMPANY . 630 FIFTH AVENUE, NEW YORK 20, N. Y.

FINEST CRUDES + EXPERT RESEARCH

and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE



... to millions of feet of job-tested installations. The principle of expansion and contraction joints designed to absorb shrinkage and creeping of concrete under varied weather conditions has been universally accepted.

Keystone CENTER STRIP for Longitudinal and Transverse Keyed Joints "Tongue and Groove"

Tongue and groove joints (with or without dowel bars) have proved an efficiency vastly superior to all existing types. Maximum load transmission is assured when pre-formed KEYSTONE center strip is used both longitudinally and at 15 foot spacings transvers-

Ask about the NEW
KEYSTONE EQUIPMENT LINE

ally.

... available at manufacturer's prices directly from KEYSTONE Asphalt Products Company.

KEYSTONE ASPHALT PRODUCTS CO.

A Division of the American-Marietta Company
43 E. OHIO STREET, CHICAGO 11, ILLINOIS

Foundation work is under way for the new plant which The Foxboro Co., Ltd., is erecting on a 3½-acre site in the Ville LaSalle section of Montreal. The completed building will be turned over to the owners in the spring of 1947, ready for immediate occupancy. The brick and steel plant will consolidate machining, metal finishing and other basic operations, and assembly and calibration of instruments, on one floor level.

The Pittsburgh Plate Glass Co. has announced the purchase of the Morck Brush Manufacturing Co. of San Francisco, according to J. H. Heroy, vice-president of the glass firm. A manufacturer of painters' brushes and master painters' tools, the San Francisco unit will continue operation as the Morck Brush Division of the Pittsburgh Plate Glass Co.

Robert D. Evans has joined the sales development division of Caterpillar Tractor Co. as civil engineer consultant on earthmoving equipment and its applications, according to H. H. Howard, general sales manager. A graduate of Peoria, Ill., Central High School, Mr. Evans entered the University of Wisconsin where he completed pre-law studies, then obtained a degree in civil engineering from the University of Illinois.

The Komline-Sanderson Engineering Corp., Ridgewood, N. J., has been formed for developing and marketing machinery and equipment for the treatment of sewage and industrial wastes. Partners in the concern are Thomas R. Komline and Walter H. Sanderson. Arrangements have been made with the Instant Drying Corp. for use of the basic patent on the spray-drying of sewage sludge.

To take care of the growing demand for concrete equipment, Whiteman Manufacturing Co. has doubled the floor space of its building at 3249 Casitas Ave., Los Angeles, Calif. The chief products of this handsome factory are Whiteman radding machines and floating-finishing machines.

A. C. Fetzer, vice-president, has been elected to the board of directors of the Mack Manufacturing Corp. Mr. Fetzer, who was acting general sales manager, was at the same time appointed general sales manager.

Designed to Cut Drilling Costs Jhree Ways . . .

The couplings described below assure a threeway saving on rock drilling and other air tool operations.

- 1—Superior strength and durability give them longer service life.
- 2—Their tight, leakproof grip on the hose eliminates all possibility of pressure losses.
- 3—Efficient design and smooth finish prevent damage to hose ends.



"G J-BOSS" AIR HAMMER COUPLINGS

Ground joint construction—no worn or mislaid washers to replace. Built for heavy duty and hard wear. Furnished with strong "Boss" Interlocking Clamp. Large wing nut facilitates connecting and disconnecting. Compact and heavy types. Cadmium plated—rustproof. For washer style, specify "Boss" Air Hammer Couplings.



"DIXON" AIR HAMMER COUPLING

Washer style. Efficient, durable, inexpensive. Steel stem has deep, smoothly finished corrugations. Rugged malleable iron clamp has dual gripping ridges on inner surface. Compact and heavy types. Cadmium plated—rustproof. Also available in ground joint construction—specify "G J-Dixon" Air Hammer Couplings.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.



IT'S DEPENDABLE





with OSGOOD Air Control

Smooth, effortless steering—without stopping the forward motion of the machine—with the cab in any position—that's OSGOOD Air-Controlled Steering! Independent air cylinders, actuated by a small lever in the cab, disengage and set steering brakes on the driving sprockets instantly, eliminating the need to hunt for a point where a steering lock can be engaged.

OSGOOD Air Control means faster, safer operation . . . more work done in

less time, with less effort. Plan now to choose an OSGOOD. A complete line of power shovels, draglines, cranes, clamshells, backhoes and pile drivers . . . a model for every type of work.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. DE THE GENERAL CO.

DIESEL, GASOLINE OR ELECTRIC POWERED • 36 TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

HEAT:.. where you want it with the HERMAN NELSON Self-Powered HEATER

can be used for:

space HEATING of temporary buildings, storage sheds, repair shops, buildings under construction.

PREHEATING engines and all kinds of mechanical equipment.

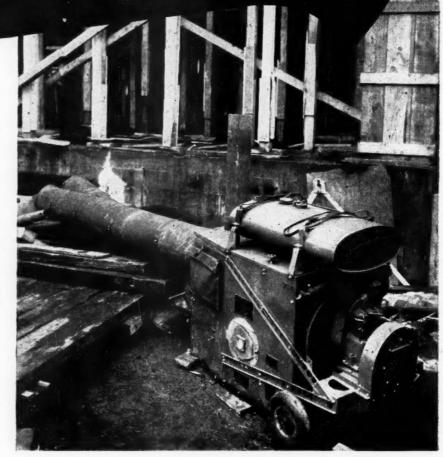
spot heating of materials, workmen, machinery, storage tanks, tools.

THAWING frozen areas and machinery, wheels, gears, transmissions, caterpillars, etc.

DRYING and curing of materials, plaster, paint, mortar, concrete, etc.

VENTILATING and heating of manholes, tunnels, box cars, ship holds, confined areas of all kinds.

- ★ Enough Heat for Three Ordinary 5-Room Houses
- ★ No Smoke . . . No Soot . . . No Open Fire
- ★ Easy to Move From Place to Place



Keep Men on the Job in Coldest Weather . . . Cut Winter "Waiting Time"

You'll be practically independent of winter's severest cold on any construction job with the HERMAN NELSON SELF-POW-ERED HEATER. Jobs go ahead faster, men are able to work better . . . it's easier to fill contracts on time by using this versatile source of heat.

There's quick heat ... where you want it ... with this portable self-contained heating unit. Burns gasoline by a new, safe method — requires little attention. Easily handled by one man.



THE HERMAN NELSON CORPORATION

for 40 years manufacturers of quality heating and ventilating products

MOLINE. ILLINOIS

Aren't those grades a little TOO FLAT?

NO... because we're

putting in

TRANSITE* SEWER PIPE



Transite's exceptionally high-flow capacity (n=.010) often permits a choice of two important economies:

(1) Flatter Grades: This means shallower trenches and correspondingly lower excavation costs—an especially important economy when dealing with deep trenches.

(2) Smaller Diameter Pipe: An alternate economy which the designer may take advantage of when deep trenches are not a problem.

Savings like these are possible because Transite Sewer Pipe has an exceptionally high-flow capacity (n=.010). Composed of an intimate

mixture of asbestos and cement built up on a polished steel mandrel, Transite Sewer Pipe has a smooth interior surface that offers minimum resistance to the flow of sewage.

Other money-saving Transite advantages are:

Less Infiltration—because of sleevetype joints that stay tight...and long 13-foot lengths that result in fewer joints. Thus, the load on the treatment plant is reduced—treatment costs are lowered. More Economical Installation—because Transite's light weight and long lengths make it easier to lay this pipe to line and grade.

Lower Maintenance Costs—because of Transite's asbestos-cement composition that combats corrosion inside, outside, and all the way through—plus tight joints that prevent costly root trouble.

For all the facts, write for the Transite Sewer Pipe brochure. Address Johns-Manville, Box 290, New York 16, New York.

* TRANSITE is a registered Johns-Manville Trade Mark

Johns-Manville TRANSITE SEWER PIPE



HOW Republic HOSE MAKERS BUILD FOR BUILDERS

N their exclusive role of serving industry's rubber needs, Republic technologists have found a distinct challenge posed by hose requirements of the construction field. Nowhere else, for example, is found more often such an uncompromising need for hose that is light in weight, highly portable, flexible and easy to handle. And the same hose must have peak ruggedness to stand up under high pressures, constant dragging over sharp, ragged surfaces, exposure to the elements, etc. These opposites in hose properties are brought together, each in maximum possible degree, by Republic hose building experts. Employing especially developed rubber compounds and reinforcing structures, they build into each type and grade of Republic Construction Hose service characteristics that mean both unexcelled working facility and long performance. Order from your Republic Distributor.



MORE SERVICE FROM RUBBER FOR INDUSTRY

REPUBLIC RUBBER

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LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS



CONSHOHOCKEN PA

Frederick I. Hausman, formerly treasurer, has been elected president of the Hausman Steel Co., Toledo. Elected vice-presidents were Roy G. Walton, in charge of field operations and concrete form work, and Ben Hausman, in charge of material sales in Toledo. Myer Hausman continues as vice-president in charge of the Columbus, O., office and warehouse. James S. Hausman, formerly vice-president, was elected treasurer; and Lester E. Jones, secretary.

Appointment of Homer L. Baker as sales manager of the Louisville Cement Co., manufacturers of Brixment and Speed Portland Cement, has just been announced. Joining the Louisville Cement Co. in 1927, he was southeastern sales representative for thirteen years. In 1940 Mr. Baker was brought into the home office at Louisville to become assistant sales manager.

Frank C. McManus, former factory manager of the Long Island City, N. Y., plant of Mack trucks, has been appointed factory manager of the Fuller Manufacturing Co., Kalamazoo, Mich. Mr. McManus comes to the Fuller company, makers of heavy-duty transmissions, with nearly 30 years of experience in automotive work and plant supervision.



Hand and Motor Driven Spray

Other Products

CONCRETE VIBRATORS

Gasoline Engine and Electric Motor Driven Models

FRONT END SHOVELS

For Industrial Tractors

AGGREGATE DRYERS

for Stone and Sand

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ASPHALT PLANTS

Portable — Stationary

Write for Circulars

White Mfg. Co.

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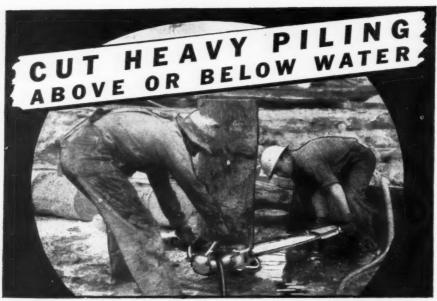
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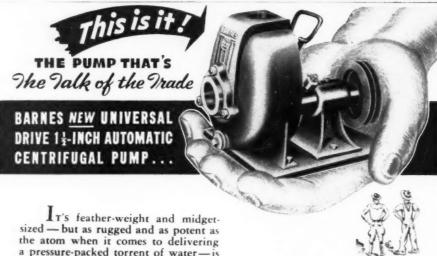
with Mall PNEUMATIC

Specifications for speedy dock and bridge construction—harbor improvements—road building—and large engineering jobs call for the Mall Pneumatic Chain Saw. This versatile heavy duty power tool goes through a 12 x 12 in 10 seconds . . . it cuts piling within 2 inches of the ground . . . it can be used under water. Its 360 degree index allows horizontal, vertical or any angle cuts the exhaust keeps the blade free from dirt. IMMEDIATELY AVAILABLE in 24, 36, and 48 inch cutting capacities.

Write CHAIN SAW DIVISION for name of nearest distributor. Demonstrations arranged. MALL TOOL COMPANY, 7757 South Chicago Avenue, Chicago 19, III.

★ 25 Years of Better Tools for Better Work





a pressure-packed torrent of water-is this brand new 3MU Universal Drive 11/2-inch Automatic Centrifugal Pump.

And it's designed to utilize any power source-belt driven from tractor, jeep or any gasoline engine or direct shaft-coupled to electric motor.

So light (35 lbs.) it can be carried with one hand, its powerful non-clogging impeller will cascade a torrent of water up to 5700 gallons an hour with pressure up to 35 pounds per square inch. The same Automatic Prime, Barnes Superseal, Direct Flow Suction, Non-Clogging Impeller and all other special features found in Barnes famous "33,000 for 1" Pumps are in the new 3MU Automatic Centrifugal. It's the handiest Implement on the place for contractors, industrial plants, municipalities, farmers and gardeners or wherever a power source is available.

You get all these in Barnes' New 3MU Automatic Centrifugal Pumps, plus the fact that they are now ready for delivery. If you order now, there'll be no waiting.

ARNES MANUFACTURING CO.

Quality Pump Manufacturers for 50 Years MANSFIELD, ONIO

Hercules Motor Corp., Canton Ohio, announces the opening of a direct factory branch on the West Coast at 2065 East 37th St., Los Angeles, Calif., to broaden its program of supplying engines, power units and replacement parts throughout the western part of the country. W. W. Cromley, vice-president in charge of West Coast operations, is in direct charge of Hercules activities west of the Rocky Mountains. He is assisted by Oliver Kelly, Herbert Wirshing, and Walter Batty, who will handle the sales activities. Several distributors to serve Arizona, Oregon, Washington, Calfornia, Colorado, Idaho and as far north as British Columbia, Canada, have been appointed: Loggers & Contractors Machinery Co., Portland, Ore.; Diesel Motor & Equipment Co., Phoenix, Ariz.; Star Machinery Co., Seattle, Wash.; Bay Engine & Parts Co., San Francisco, Calif.; Engine Supply Co., Denver, Colo.; Sawtooth Co., Boise, Ida.; Hayes Manufacturing Co., Ltd., Vancouver, B. C.; Brown-Bevis Equipment Co., Los Angeles, Calif., and H & B Sales Co., Long Beach, Calif.

Joseph Samuel Young, Allentown, Pa., president of the Lehigh Portland Cement Co., was selected chairman of the board of directors of the Portland Cement Association at its recent annual meeting in Chicago. He succeeds M. Moss Alexander of St. Louis, president, of the Missouri Portland Cement Co.

Four distributors for Gradall, multipurpose earth mover of the Warner & Swasey Co., Cleveland, Ohio, have been announced. W. W. Williams Co., Columbus and Cleveland, for Ohio; Construction Equipment & Supply Company, Pittsburgh, for western Pennsylvania; Telford Equipment Co., Lansing, Mich., for Michigan; Rupp Equipment Co., Buffalo, for all New York state except metropolitan New York.

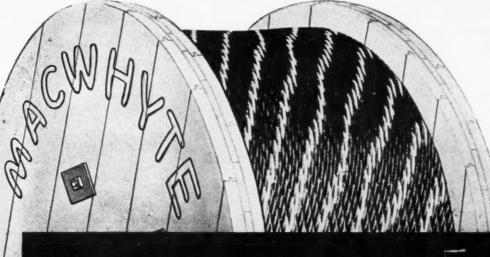
Appointment of Charles O. Roome as manager of the St. Louis district heads a series of field personnel changes in the mechanical goods division of Goodyear Tire & Rubber Co., Akron, Ohio. John E. Reagan, manager of the St. Louis district since 1935, has transferred to Atlanta as district manager. Philip C. Antoine goes to New Orleans, transferring from Memphis, Richard P. Goodenough succeeds Mr. Antoine at Memphis. Charles H. Murtaugh is at South Bend, Ind., replacing Gerald W. Zolman, who returns to Chicago. At Charlotte, N. C., Carl Baker becomes field representative. Robert J. Ario will transfer to Cleveland from Orlando, Fla.; William R. Burtle succeeds Mr. Ario in Florida, transferring from Philadelphia. His successor in Philadelphia is Robert C. Alexander.

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Macwhyte Wire Ropes include:
MACWHYTE PREformed and
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MONARCH WHYTE STRAND
Wire Rope ... Special Traction
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Wire Rope ... Monel Metal
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Rope. Macwhyte also makes
Atlas Braided Wire Rope
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MACWHYTE WIRE ROPES...

all job-proved ... assure you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company
2941 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Minneapolis Fort Worth • Portland • Seattle • San Francisco • Los Angeles Distributors throughout the U.S. A. and other countries.

NQ. 892

Make MACWHYTE your headquarters for WIRE ROPES



Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

Production from native Minnesota stone of materials urgently needed for the building of homes and for other construction will be greatly increased by The Carney Co., Inc., as the result of a \$250,000 modernization and expansion program at its quarries and plant at Mankato, Minn. The Carney Co., organized in 1883, manufactures and distributes rockwool insulation, natural cement, masonry cements and lime and crushed stone products throughout western half of the United States.

Announcement was made on the sale of Forss Pneumatic Tool Co., Aurora, Ill., to Skilsaw, Inc., of Chicago, one of the country's largest manufacturers of portable electric tools. The Aurora plant, which will be known as Pneumatic Division of Skilsaw, Inc., will remain in Aurora and plans are underway for its expansion. The Forss personnel, including two of the former owners, F. P. Forss and J. W. Forss, will be retained by Skilsaw, Inc.

A. S. Marlow, Sr., president, Marlow Pumps, Ridgewood, N. J., was elected chairman of the Contractors' Pump Bureau for 1947. He succeeds John H. Hase, C. H. & E. Manufacturing Co., Milwaukee, Wis.





wear-resistant steel, are reversible. The additional life gained is just another of many Heil cost-cutting features. Here are a few more that save you time and money on any job:

The easy-handling, trouble-free Heil hydraulic unit provides quick finger-tip control. The positive action enables the operator to place the blade exactly where he wants it — he can die foster and move more die. The all yielded here

vides quick finger-tip control. The positive action enables the operator to place the blade exactly where he wants it — he can dig faster and move more dirt. The all-welded, box-section construction, the sturdy connections, and the proper distribution of loads and stresses keep your tractors on the job longer — making bigger profits for you. Install a Heil Hydraulic Bulldozer on your Oliver-Cletrac as soon as possible. It's an easy, quick mounting job. See your Oliver-Cletrac distributor.



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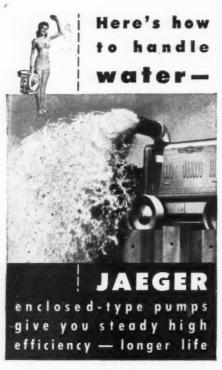
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THE HEIL CO.

dozer. Yardages are bigger — costs lower. The secret of this unequalled rolling action lies in the design of the Heil Bull-dozer blade. The scientific contour of this blade, developed after many years of earthmoving experience, provides a cleaner cutting action and a bigger load-carrying capacity without increasing size or weight. The cutting edges, made of special

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN



To a better engineered, more amply powered, conservatively rated line of pumps, Jaeger has added all-weather protection of all heavy duty models of 2" to 10% size — for sustained efficiency of pump and engine, extra hours of smooth, dependable performance, plus easy accessibility at all times.

2" and 3" Heavy Duty: Most rugged

small pumps built.

Conservatively rated @ 10,000 and 20,000 g.p.h.

4" to 10" Portobles: Compact, extra powerful units of 40,000 to 240,000 g.p.h. rating and exceptional air



Only Jueger Offers All These Inherent priming action plus "jet" priming — doubly sure and fast . . . long-life "Lubri-Seal," accessible for inspection . . . self-cleaning shell design . . . replaceable liners or seal rings . . . Every pump tested and certified for performance.

Sold, Serviced in 128 Cities

THE JAEGER MACHINE CO.

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NEW YORK 17, N. Y. CHICAGO 1, ILL.

235-38 Martin Bidg., BIRMINGHAM 1, ALA.

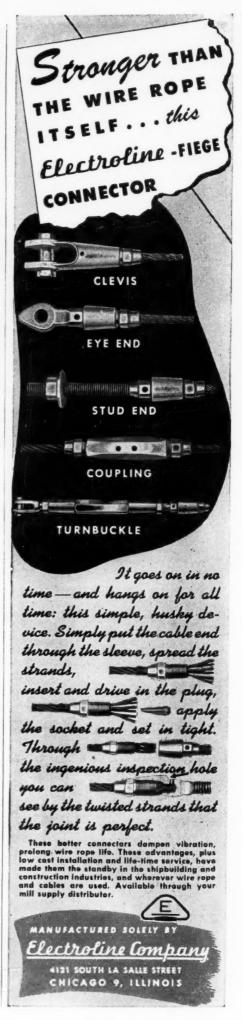
L. A. Peterson, president of the Otis Elevator Co., New York, has announced the election of Percy L. Douglas and Bruce H. Wallace as vice-presidents. Mr. Douglas will continue in charge of the company's foreign operations and Mr. Wallace will have general responsibility for all accounts and budgets. L. W. Whitton has been appointed manager of operations and C. C. Campbell, general works manager.

Richard R. Bastian has joined the management group of Glass Fibers, Inc., Toledo, Ohio. He recently resigned as general purchasing agent of Owens-Corning Fiberglas Corp.

The Ash Grove Lime & Portland Cement Co., Kansas City, Mo., has announced several executive changes: L. T. Sunderland, formerly president, becomes chairman of the executive committee; W. P. Sabin, vice chairman of the executive committee; Paul Sunderland, chairman of the board; Allen B. Sunderland, president and secretary; L. Kittle, executive vice-president and treasurer.

The American Keene Cement & Plaster Co. plant at Siguard, Utah, has been sold to the newly-formed Western Gypsum Co. for \$1,500,000, K. J. Hill, president of the Salt Lake City branch of American Keene, reports. Sidney H. Eliason, Pacific Coast district manager of the U. S. Gypsum Co., and W. S. Mole, Chicago, are buyers of the plant and operations. The new company expects to produce gypsum lath and wallboard, starting production next spring.

Seven supervisory changes in the Minneapolis - Honeywell Regulator Co. have been announced by C. B. Sweatt, executive vice - president. James S. Locke has been named sales manager of the division with headquarters in Minneapolis. George D. Guler is regional manager in Atlanta. He succeeds Albert H. Koch who has been made Philadelphia branch manager. Succeeding Mr. Locke in Chicago will be J. F. Cummiskey, while L. C. Johnson has been promoted to branch manager in Milwaukee, replacing Harold Pride who has resigned to accept a position with a Honeywell distributor. J. C. Dorsey is placed in charge of manufacturers' business in Philadelphia. In Minneapolis, T. S. Carley is sales manager of the wholesale division and of Honeywell's stoker controls division.



Drill steel is drill steel ...isn't it?

Well-yes and no.

Stand two drill rods side by side. Perhaps they look alike—exactly alike. Yet one will do the job you want it to do. The other may fail.

That's why it's so very important to ask for Bethlehem Hollow by name. It's the "old reliable" drill steel in mining, tunneling, road-building, quarrying—yes, wherever rock is drilled and shot.

Over the years, Bethlehem Hollow has been proved a mighty dependable product—equally suitable for threaded rods and forged-on bits. We've said that before . . . but not nearly as often as the users themselves.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

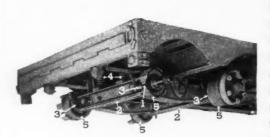
BETHLEHEM HOLLOW DRILL STEEL







BE **SURE** YOUR NEXT TRAILER HAS ALL THESE FEATURES . . .



Deep, wide flange main beams running the full length of the trailer, l-Beam sections for crossmembers and outriggers, improved, fabricated gooseneck, and all electric-welded construction. Look at all the other fea-

tures found only on Jahn tandem axles: (1) constant lift cam, (2) two full-width axles attached to longitudinal rocker beams, (3) worm gear type slack adjusters at each wheel, (4) heavy coil springs at each axle and

(5) positive equalizing braking at each wheel regardless of position of axle.



C. R. JAHN COMPANY

1335 W. 37th Place Chicago 9, III.

Heavy duty trailers from 5 to 100 tons.

CONTRACTORS RUBBER PRODUCTS available from Stock for immediate Delivery

CONVEYOR, ELEVATOR and TRANSMISSION BELTING

all widths and plys

V-BELTS all sizes

HOSE all sizes

AIR WATER

SUCTION

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FUEL

STEAM WELDING

PILE DRIVERS

FIRE VACUUM

WELDING

ROAD BUILDERS

and BOOTS, DREDGE SLEEVES, PUMP DIAPHRAGMS, ETC.

and everything rubber for Industrial Requirements

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Write for new catalog

CARLYLE RUBBER CO., Inc.

2-66 PARK PLACE NEW YORK 7, N. Y.

Phone: BArclay 7-9793

David W. Lehti, vice-president of the Link-Belt Speeder Corp. since 1942, has been named president, with offices in Chicago and Cedar Rapids. He succeeds Troy M. Deal. Mr. Lehti first became associated with the company as distributor in 1925.

A new type office building has recently been completed at the Pittsburgh plant of Joseph T. Ryerson & Son, Inc., steel jobbers. The building, a two-story, steel, brick and stone structure, is so located with respect to plant operations, coupled with the engineered arrangement of the general offices, that order flow is streamlined to permit exceptionally fast handling. The Pittsburgh plant is located at Arch St. and Bell Ave., Carnegie, Pa.

Promotion of O. W. Bynum as manager of direct sales, John A. Gazelle as manager of distributor-dealer sales and Carl U. Spriggs as assistant general sales manager has been announced by Arthur P. Shanklin, vice-president and general sales manager of Carrier Corp., Syracuse, N. Y. All three will make their headquarters in Syracuse. Mr. Bynum will be in charge of the sale of larger air conditioning, refrigeration and industrial heating equipment direct to customers, and will also supervise Carrier's contracting, field engineering and installation activities. Mr. Gazelle. will be in charge of all distributor and dealer sales which are made through 48 distributors and $3{,}552$ dealers throughout the United States. Mr. Spriggs came to Carrier after extensive experience in appliance merchandising and industrial sales work.

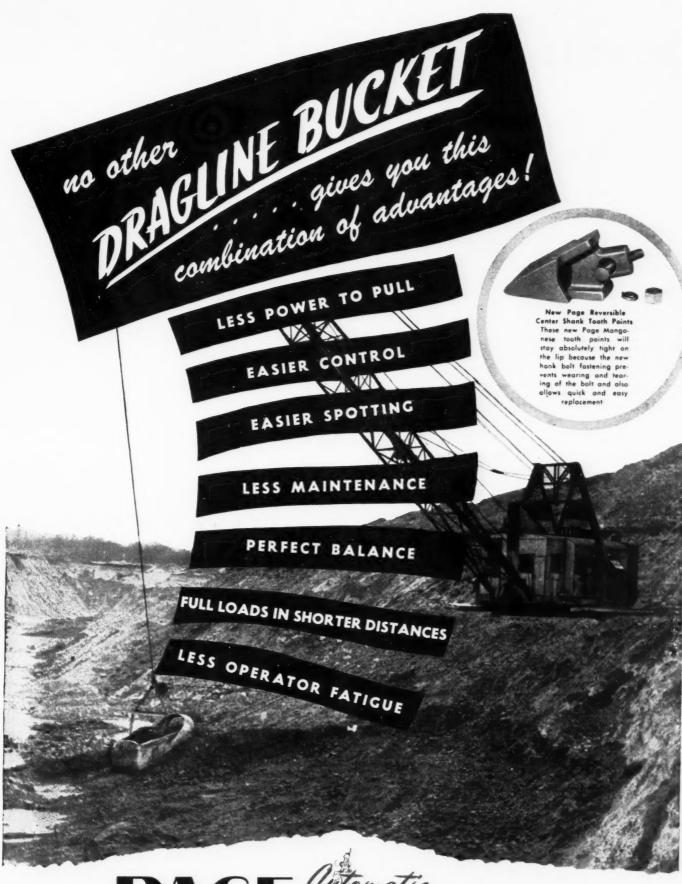
Appointment of Lynn W. Young as Midwest district sales representative for Sealz, highway joint sealing compound, has been announced by Samuel P. Tauber, sales agent, Naugatuck Chemical division of United States Rubber Co. Mr. Young's territory includes Texas, Oklahoma, Kansas, Nebraska, North and South Dakota, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Michigan and Kentucky and his headquarters are at 4804 Jefferson St., Kansas City, Mo.

Appointment of Elton E. Peavy as Southwest district manager for the sale of Dresser products to the water industry has been announced. He will cover the southwest territory including Texas, Louisiana, Oklahoma, Arkansas, Mississippi and New Mexico. Mr. Peavy succeeds H. R. Shidel who will direct the sale of Dresser welding fittings in this area and supervise the Houston, Tex., warehouse.

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Julien R. Steelman, Koehring Co., Milwaukee, Wis., was elected chairman of the Mixer Manufacturers' Bureau for 1947 to succeed G. K. Viall, Chain Belt Co.

Davey Compressor Co., Kent, Ohio, recently announced the following appointments: F. S. Ray Co., Houston, Tex., as a distributor to handle the complete Davey line. Claude B. Smith Co., San Francisco, Calif., has been made Northern California distributors of Davey compressors, with complete sales and service facilities on all items of Davey manufacture. J. T. Myers has been elected vice president of the Davey Compressor Co., in charge of sales and production.

Strike-bound since October 7, the Commercial Body Building Division of the Smith Commercial Body Works, Fargo, N. D., was recently discontinued according to Donald A. Smith, president. This move is coincident with expansion of a department devoted to selling municipal equipment and supplies, plus increased emphasis on the sale of general construction equipment and truck and bus equipment. New name of the organization is Smith, Incorporated.

Three promotions within the sales department of Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio, have been announced. New sales manager and department head is G. L. Smith. Myron C. Meyer replaces Smith as traveling sales manager. Ralph W. Deemer replaces Mr. Meyer as assistant sales manager.

Fischer & Porter Co., manufacturers of variable area type flow rate instruments, heretofore called "rotameters" has changed the name to "flowrators." It is hoped that the trademark name "Flowrator" will distinguish Fischer & Porter Co.'s products from all others and at the same time provide a more accurate and appropriate term for area flow rate measurement instruments.

St. Louis office of the Clipper Manufacturing Co. has been consolidated in part with the company's new factory and general office building in Kansas City, Mo. The warehouse remains in St. Louis. The new address is 2800 Warwick, Kansas City 8, Mo. Executive personnel includes: Neligh Coates, president; Robert G. Evans, assistant general manager; Art Wiedmann, sales manager; Harold J. Wright, engineer; Laurence V. Michaux, export manager; Robert M. Stubbs, assistant advertising manager.

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Soil Cement Roads

(Continued from page 93)

ers and powered by two 150-hp. G.M. diesel engines. The stabilizer makes a 6-in. cut 8 ft. 3 in. wide. Material, including the cement layer, is cut loose by a series of cutters on a revolving drum, then is passed back by blades on a blending drum into an area thrashed by two pugmills where cement and soil are thoroughly mixed with water from spray bars. and the mixture is spread back in an even layer by a strike-off blade on the rear of the box. Water comes from a 1,500-gal. water truck pushed ahead of the stabilizer and is introduced to the mix as the material is passed back to the pugmills. The machine travels from 6 to 28 ft. per min., depending upon the hardness of the soil and depth of cut to be made. On the Durham County job the soil is heavy clay, full of small boulders which caused some trouble to the cutters.

After a 500-ft. section has been

(Continued on page 186)



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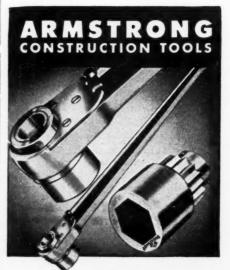
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stabilized in three passes, the rig moves on to the next section where the cement has been spread in advance. Then a Caterpillar No. 12 patrol grader scarifies any compaction resulting from local traffic, and shapes the mixed surface. On this machine the small front wheels have been replaced with standard rear-wheel tires to balance compaction and load.

Along with blading, a special harrow, built by the contractor and mounted on the front end of a small International wheel tractor by a hydraulic hoist, works the surface to prevent formation of cleavage planes. After the grader is through, the harrow is backed over the section to leave the surface loosened.

Then a special sheepsfoot roller, with no lugs on the feet so it can work backwards or forwards, gives the mixture good compaction. This roller is mounted on the front end of an International TD18 tractor, fastened to the cable-operated frame of a bull-

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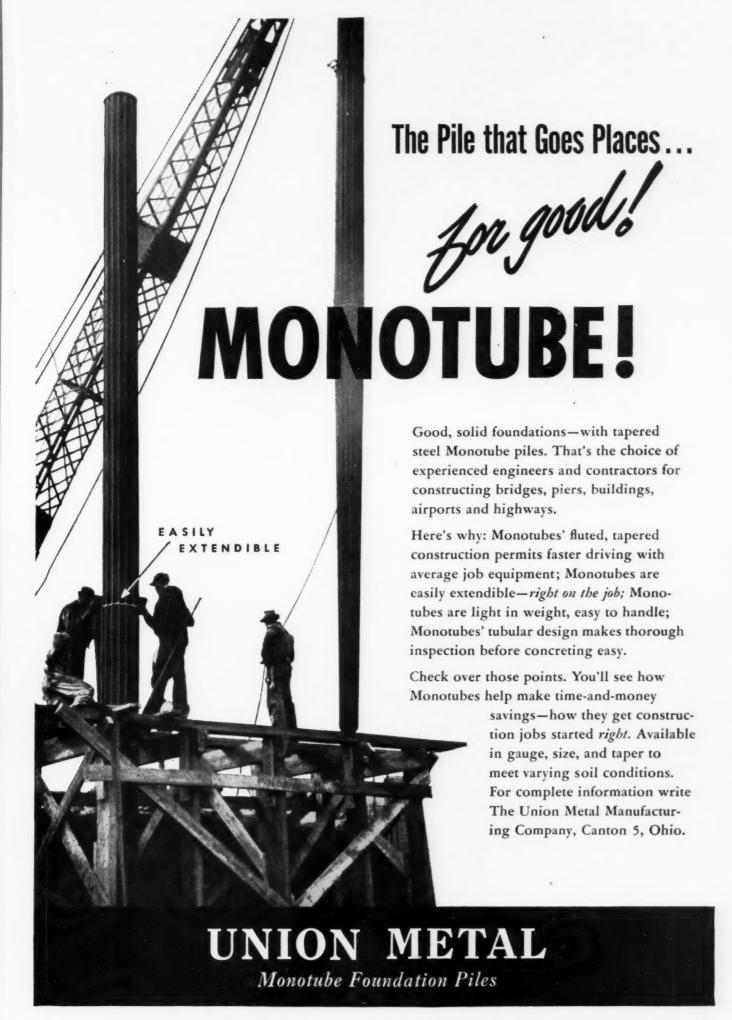


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JGHLIN





(Continued from page 186)

dozer so the roller can be raised free of the road.

Following compaction by the sheepsfoot, the surface is further smoothed and compacted with a pneumatic roller pulled by an International wheel tractor. This roller carries sand ballast and also the job tool box. During any of the shaping and compacting operations water is added from a sprinkler truck if necessary to keep the mix pliant. Additional water is always required on a hot

After a wait of 6 to 8 hr., the surface is clipped with the grader to skim and shape the surface, and clipped material is cast aside. Then the road is given a final pass with a drag broom and the pneumatic roller, and after 7 days of curing it is ready for asphalt surfacing.

Hot mix is applied and spread with a Barber-Greene paver. After rolling, the road is ready for traffic, though traffic is not barred during any of the operations.

Dick Bean is superintendent on the work for Teer. William Sizer is resident engineer for the state highway department.

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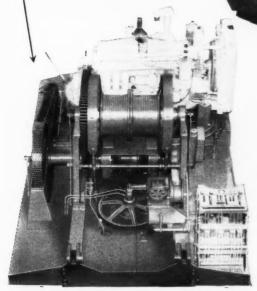
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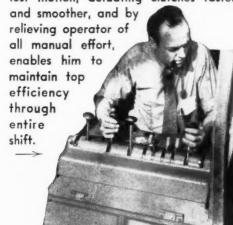




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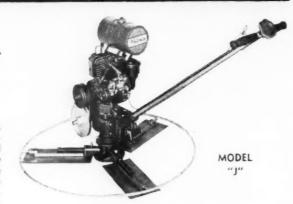
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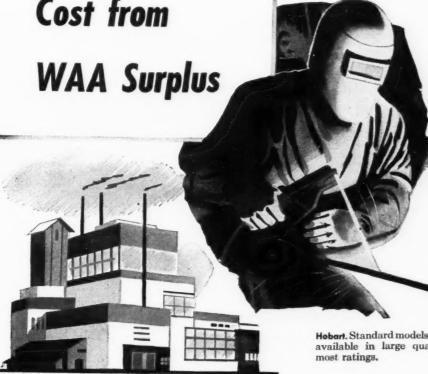
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WIRE ROPE

IS

101 YEARS

OLD



.. and feeling very well, thank you

■ We used to wonder how it would feel to be part of a business organization 100 years old. Now we can tell you that it feels good. Not because the first hundred years are the hardest. That saying may or may not be true, and it doesn't really matter. What does matter is that we have now entered our second century of service with a wonderful group of distributors, a wealth of experience, a good reputation, sound business health, and an eager desire to continue servicing our old friends and make many new ones.





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Get them together and you will have the formula for greatly reduced drilling costs. It doesn't matter what kind of rock it is; there's a Timken Rock Bit to match and master it.

TIMKEN
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ROCK BITS

What makes the Timken Bit the superior rock drilling tool it is? (1) a detachable principle that has proved its correctness by more than 14 years service under all rock drilling conditions in mines and construction work. (2) Timken Steel developed especially for Timken Rock Bits and produced in our own steel plant. (3) Timken metallurgical "know how" in heat treatment and hardening. (4) uniform quality and performance; every Timken Bit will give the same outstanding service in speed of penetration and depth drilled when used in the same kind of rock.

No matter where you are there's a Timken Rock Bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken Bits to work now — cut drilling costs, increase production.

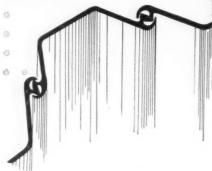
UB CATION

Crew pins boom to mast as final step in jumping guy derrick on Esso Building in New York.

How to Jump a Guy Derrick . . . Bridge Raised in Brooklyn . . . Heavy Grading on Shirley Highway Extension . . . Pipe Caissons Carry Submarine Oilwell Derricks . . . Camp Howze Demolished in Fast Time . . . Rocky Road to Mt. Mitchell



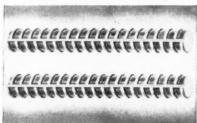
THIS INTERLOCKING GRIP MEANS—



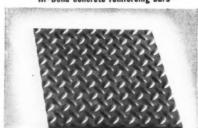
For the Contractor — Inland also supplies:



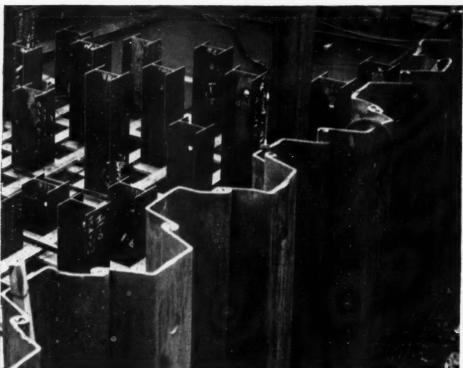
I-Beams and other structural shapes -



Hi-Bond concrete reinforcing bars-



4-Way safety steel floor plate -



INLAND PILING IS ON THE JOB

The construction industry knows and appreciates this popular interlocking grip and the other advantages of Inland sheet piling. Straight—strong and tough, it drives freely, produces water-tight cofferdams under pressure, and can be pulled and redriven time after time. Actual cases are on record where Inland Piling has been reused as many as fifteen times.

Accurately rolled with uniform high quality, Inland sheet piling is made of special analysis steel for extreme strength and resistance to corrosion. Eight different sections are available for various applications on single or double wall cofferdams, cellular breakwaters, docks, bulkheads or retaining walls. Piling may also be rented, when available.

Inland engineers are at your service to assist—in design, layout and selection of proper material for your installations. They may also be able to help you with practical operating suggestions. Call on them at any time.

ILLUSTRATION ABOVE: Inland sheet piling used on cofferdam for Illinois river bridge. Great Lakes Dredge & Dock Co., Contractors.



INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Paul, St. Louis

SHEETS . STRIP . TIN PLATE . BARS . PLATES . RAILS . TRACK ACCESSORIES

Construction Methods

THE CONSTRUCTION MAGAZINE WITH PICTURE POWER Established 1919

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MARCH 1947 Volume 29 · Number 3

CUTS AND FILLS

HERE'S HOW IN THIS ISSUE

BIGGEST SHOW in history is promised by the American Road Builders' Association for the 1948 Road Show, scheduled for the week of Feb. 16 in Chicago at the old Chicago Dodge war plant. After a Road Show lapse of eight years, the promise should be fulfilled, for manufacturers will be eager to parade their wartime and war-retarded developments. Better mark that week on your calendar right now, for this show will be something construction men can't afford to miss.

AT THE ROAD SHOW you will see new ideas in soil compaction equipment and soil stabilization machines, for the manufacturers are finally able to turn their attention to this rapidly developing field. You will see new earthmoving units with their own prime movers. You will see more machines on rubber than ever before, including bulldozers. You will see improved shovels, graders, loaders, mixers, asphalt plants and a big list of smaller units such as compressors, drills, vibrators, saws and pumps. You will see a combination shovel-conveyor. In fact, you will see so much new and improved construction equipment that you will wonder how we ever operated as well as we did prior to the war.

STUDENTS bent upon construction as a career will soon find civil engineering schools offering them an educational background for such a career, for activities of construction education committees in the ASCE and ARBA are receiving the attention of engineering colleges. The need for construction education is obvious. Construction, civil engineering's main industry, deserves recognition in engineering curricula. The present weakness in establishing construction courses is lack of textbooks and teaching material. Text books must be written, but a wealth of teaching material is available in association, con-

78 GUY DERRICK is jumped two floors at time 82 **HEAVY SPAN** is raised five feet in two days CITED FOR SERVICE Charles H. Locher 85 MORRISON AND CRIMMINS receive Moles' Award's 86 88 SPECIAL TOOLS wreck big Army camp GERMAN FLOATING CRANE is acquired by Navy 91 92 **NEWS REEL of construction** ELEVATING LOADER moves million yards on superhighway 94 97 RATCHET HOISTS level tilted bridge floor 98 CONSTRUCTION EQUIPMENT is tested in mud by Army PIPE-PILE CAISSONS support well rigs 100 HOW THEY DID IT . . . Construction details 104 MOUNTAIN HIGHWAY is blasted through rock 106 PERSONALITIES in field of construction 110 JOB ODDITIES 114

tractor and manufacturer files. Such material must be dug out, correlated and processed for teaching use, a big job beyond the scope of any committee. This should be done by an impartial, practical agency or bureau set up for the purpose. Since the ASCE, ARBA, AED and AGC are all interested in cooperating with colleges in establishing construction education courses, it seems logical that their efforts should be pooled to best advantage and to avoid duplication. The greatest help these associations can give the colleges is setting up a jointly-sponsored bureau for the collection and dissemination of teaching material.

McGRAW-HILL PUBLISHING COMPANY, INC. • 330 WEST 42nd STREET, NEW YORK 18. N. Y. JAMES H. McGRAW, Founder and Honorary Chairman

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ONE MAN

ALLIS-CHALMERS 2-CYCLE DIESEL TRACTOR

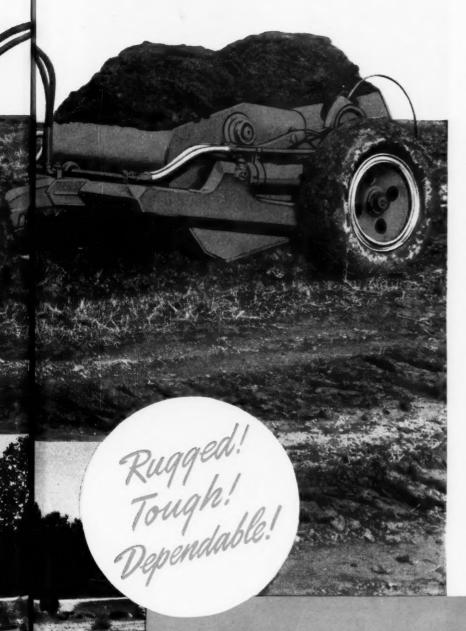


GREATER SUSTAINED PULLING POWER

of Allis-Chalmers Diesel Tractors and exceptional digging ability of Gar Wood 2-wheel scrapers enables you to load toughest materials quickly — including gumbo, hardpan and shale. The new HD-5 (above) is the ideal tractor for efficient work with the 3-yard scraper. For larger capacity . . . HD-7 tractor and 5-yard scraper is the correctly matched combination (right).



Roadbuilder WITH BULLDOZER AND SCRAPER . . .



Nearly all the dirt-moving jobs involved in the construction of a road can be handled with this fast-stepping combination. It's practically a one-man roadbuilder. You can use it three ways . . . with both scraper and bulldozer at the same time or with either unit alone.

There's the bulldozer for leveling, tearing down banks and other 'dozer work. There's the 2-wheel scraper for regular cut to fill dirt-moving . . . plus handling a multitude of other jobs. Reardump feature widens its usefulness. You can place material exactly where you want it — over slopes, around bridges, culverts and other close places. It is especially handy for digging trenches for pipe and culverts, making driveways and approaches and cleaning ditches.

An ideal, all-'round outfit for townships, cities, counties . . . it's a mighty useful combination for all contractors, as a principal dirt-mover or as an auxiliary unit. Takes over much of the work of bigger, more expensive equipment and relieves hand labor. It will pay you to investigate this one-man roadbuilder. Get all the facts from your Allis-Chalmers dealer.

ALLIS-CHALMERS





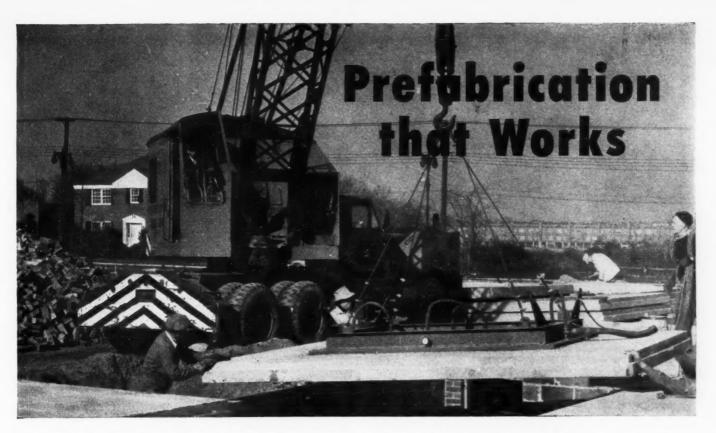
"Hey! How do you shut this d-d-d-dirty thing off?"



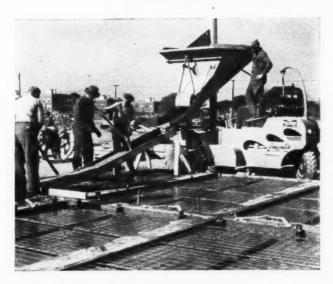
"Where did you say you got your rolling experience?"



"Go right ahead. Just dropped down to check over things."



PRECAST CONCRETE FLOORS PROVIDE UTMOST FIRE-SAFETY AT MINIMUM COST IN 110-BUILDING U.N. HOUSING PROJECT



HERE is construction history in the making. The project is Parkway Village, 110 well-designed, garden-type, apartment buildings for United Nations personnel, at Jamaica, L. I. Floors are reinforced concrete slabs, up to 14 x 14 ft. in size—a total of 6800 slabs precast at the job in 115 'Incor' concrete molds. Ribs in floor slabs, running in two directions, share the load; so the floor system averages only 2½ in. thick, including beams, slabs and girders, and uses only about half as much concrete and steel as conventional construction.

Dependable high early strength with 'Incor'* 24-Hour Cement makes it possible to lift slabs day after pouring, for lowering onto concrete foundations and walls. This method of floor construction provides stability, fire-safety and low upkeep of good concrete at minimum cost—and has great possibilities for industrial as well as residential buildings.

*Reg. U.S. Pat. Off.

 Floor slabs for Parkway Village, 110-building U. N. housing project, Jamaica, L. I., are cast at job in molds of 'Incor' concrete. Slabs are vacuum treated and lifted by vacuum lifting frame day after pouring. With 7½-bag 'Incor' mix, cylinders are testing over 8000 lbs. psi. at 28 days.

 Parkway Village, Jamaica, N. Y. Owner: Savings Banks Trust Company, representing a number of participating Mutual Savings Banks. Architects: Leonard Schultze and Associates; Engineers: Madigan-Hyland; Contractor: George A. Fuller Company, all of New York City.



LONE STAR CEMENTS MEET EVERY CONSTRUCTION NEED

LONE STAR CEMENT CORPORATION

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,500,000 BARRELS ANNUAL CAPACITY

There's always a CP Tool exactly suited to the job



A Leader in its Weight Class

The 56-pound CP-42 Sinker Drill is ideal for general excavation, road work, shaft sinking, and quarrying, because of its penetrating power, fast drilling speed, strong rotation and good hole cleaning qualities. Its low air consumption makes it especially desirable for use with portable air compressors. CP Sinker Drills range from the 28-pound CP-22 to the 119-pound CP-60N.

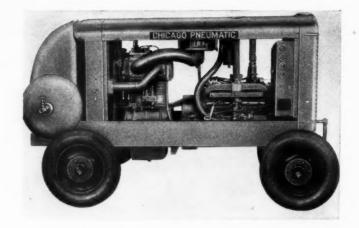
Three Models of CP Backfill Tampers

CP has a pneumatic Backfill Tamper exactly suited to any particular job. CP-3 for medium heavy jobs; CP-MM for all general heavy backfill tamping; CP-4 for extra heavy work, as in earth dams. In trench work, especially, CP Backfill Tampers soon earn their cost by saving the time and labor of handling surplus excavated material.





For whatever type of work a contractor needs pneumatic tools, he will find CP equipment designed to handle the specific job most efficiently and economically. Besides the four typical CP products illustrated, other CP tools in wide use in contracting work include wagon drills, demolition tools, clay diggers, sheeting drivers, concrete vibrators, sump pumps and sludge pumps. Write for Catalog 600.



Ample Air - with Fuel Economy

In this portable compressor the gradual speed regulator and other CP features effect fuel savings of 15% to 35%. Varying the speed in proportion to air demand also reduces maintenance. CP gasoline-driven compressors range from 60 to 315 c.f.m.; Diesel-driven, from 105 to 500 c.f.m.

Popular CP Impact Wrench

With the CP 365-RP Impact Wrench, nuts and bolts, up to 11/4" bolt size, are applied or removed in a fraction of the time required by hand wrenches. Available either with side handle or pistol grip. One of a complete line of six models.



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PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



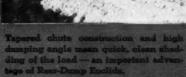
• Construction of the new controlled-access highway between Toronto and Barrie, Ontario, involves moving 7,500,000 cu. yds. of earth. Prominent among the equipment being used on the several contracts are Rear-Dump and Bottom-Dump Euclids.

On one of their contracts Peacock and McQuigge, Ltd. used power shovels for excavation and 15-ton Rear-Dump Euclids for hauling. The Euclids moved clay and gravel from highway cuts for fill at other locations. These contractors also speeded earth moving with a Euclid Loader which delivered 12 bank yds. into Bottom-Dump Euclids in an average of 48 seconds loading time.

On another section Angus & Taylor, Ltd. used 13-yd. Bottom-Dump Euclids, loaded by shovel and elevating grader, to move material on hauls of about one-half mile from cut to fill.

Rear-Dump and Bottom-Dump Euclids combine minimum vehicle weight with maximum strength and capacity. They are built to move pay dirt faster and at lower cost on off-the-highway hauls.

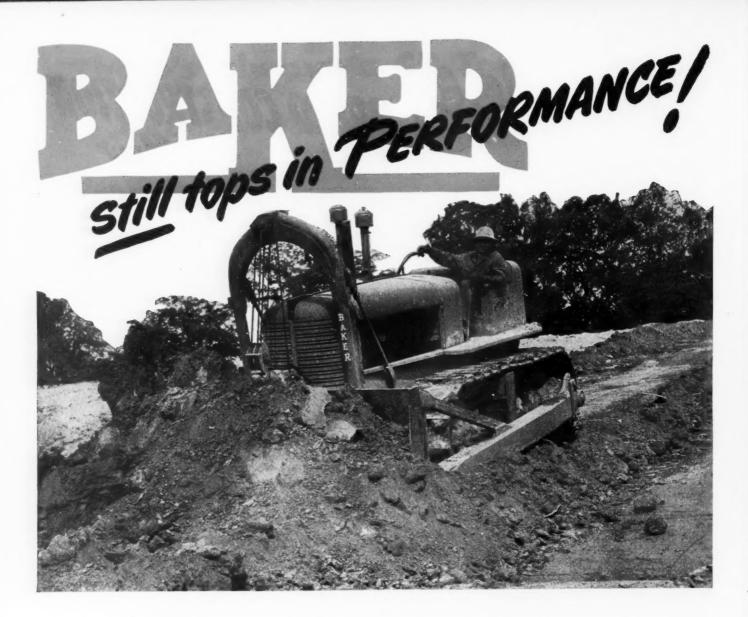
Your Euclid distributor or representative will be glad to provide helpful information for your requirements.





The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

FIGURE THE CONTROL OF THE CONTROL OF



Baker, pioneer builders of Bulldozers, have consistently maintained their leadership in the earth moving industry. There is no substitute for this experience — the engineering knowledge — the manufacturing skill which results in better on-the-job performance.

That is why Baker Bulldozers consistently out-perform anything on tracks—why Bakers are first choice of experienced users, why operators prefer Baker to any other make.

Built specifically for Allis-Chalmers Tractors to match their speed, balance, power and weight, Baker Cable or Hydraulic Bulldozers and Gradebuilders apply full tractor power to the blade — deliver maximum yardage per shift — provide longer useful service — important reasons why there are more Baker Bulldozers on Allis-Chalmers Tractors than all others combined.

BAKER MFG. CO. • Springfield, Ill.



"STRAIGHT THROUGH" ASSEMBLY LINE - ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crowler tractor plant. When you order an A-C tractor with Baker bulldazer or gradebuilder, you tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.



Tread digs in but tire doesn't; it's built to float—has greater bruise resistance

IN EXCAVATING and dumping operations, two major tire problems used to make tire costs unnecessarily high. Miring, wheels bogging down in sand, loam, and loose dirt, cost the time of the truck, men, and oftentimes other machines. The second problem was rocky ground or terrain which meant tire impacts on boulders, ruts, timbers, etc., leading to bruises, ply separation, and blow-outs.

The answers to these problems are found in tires such as those shown above — Super Traction Tire designed by B. F. Goodrich engineers. Bogging down was solved with a wider and flatter tread which has greater contact area to provide maximum flota-

tion. The tire is built to float, yet the heavy tread digs in, grips.

Answer to problem number two was a special built-in *shock shield* for greater bruise resistance. This shield, an exclusive B. F. Goodrich feature, is a set of four breakers—layers of rubber-coated nylon cords—built in between the tread and the plies. The breakers are in pairs with the cords in each pair running in opposite directions to give balanced strength.

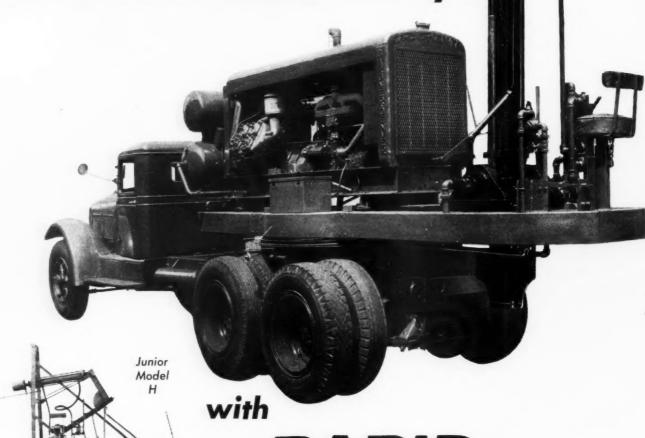
Under impact, the cords in the breakers stretch together, *not* across each other, and return to their original position. The blow is *distributed*, absorbed by the rubber cushions; shock

passed on to the cord body is greatly reduced.

Users of the Super Traction and other B. F. Goodrich tires built this way report substantial savings in operating costs. Traction is better. Tire life is longer. Repair bills lower. Find out how these tires can help solve your problems. See the B. F. Goodrich dealer or write us direct. The B. F. Goodrich Company, Akron, Ohio.

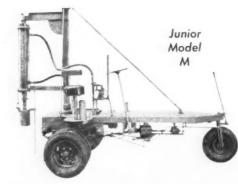
Truck Tires _{sv} B.F. Goodrich

Break Concrete the LOW COST way!



RAPID PAVEMENT BREAKER MACHINE

- Model-H can be converted to vertical machine in 30 minutes.
- Junior Model T for mounting on truck with compressor also available.
- · Write for details and prices.



- Unequaled performance in concrete breaking.
- Fastest pneumatic method.
- Not a drop weight, but a pneumatic controlled blow.
- Average working speed, 55 blows per minute.
- · Saves labor-time-dollars.
- Built to have a low upkeep cost.
- Breaks to any size desired.
- Adapted to inside or outside work.

- Increases your compressor output.
- Ideal for cutting trench and tamping backfill.
- The profitable addition to your line of equipment.
- Heavy-duty machine equipped with air motor which pivots the unit on the truck bed.
- Junior Trailer Models are equipped with air motor that propels machine and swings the boom.

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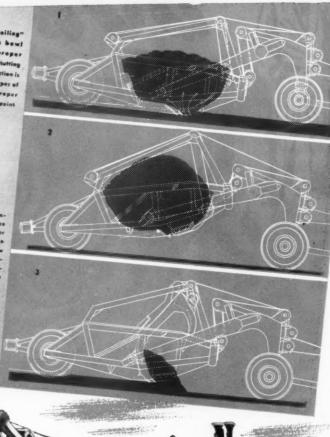


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Above: Gar Wood 4 wheel cable scraper in action

Time is money on any earth moving job. And PERFORMANCE clocks the results!

That's why GAR WOOD earth moving equipment delivers the goods.

They're design-engineered, precision built . . . and specific in application. No "just as good"—"let it ride"—"what's the difference" attitude in GAR WOOD craftsmanship.

Every product in this famous line must justify the maker: GAR WOOD.

Contact your local dealer. He will gladly show and prove GAR WOOD superior performance. Arrange to see an on-the-job demonstration without obligation.

Above: Gar Wood 2 wheel hydraulic

Below: Gar Wood dozecaster

scraper



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PROTECTED YET FULLY ACCESSIBLE



These latest model Jaegers handle more water because they keep it from your sparkplugs, carburetor and the crankcase, insure a dry, quick-starting and efficient engine to match the efficiency and long life of your Jaeger "Sure Prime" pump. Enclosures on small pumps swiftly lift off when needed. On larger models the big Jaeger housing permits far easier accessibility to all engine parts. Add this to many other reasons why Jaeger outsells and out-performs all other pumps.



- · More efficient power
- Inherent priming action plus "jet" priming - faster and doubly sure.
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- All seals accessible for quick inspection.
- Micrometer workman-Certified performance.

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and the FINEST TOOLS to go with them.

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TEXACO STAR THEATRE presents the NEW

EDDIE BRACKEN SHOW every Sunday night.

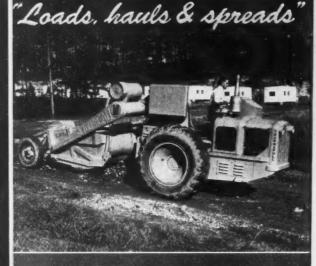
Metropolitan Opera broadcasts Saturday afternoons.





Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT

NEW small TOURNAPULL f







23 m.p.h. top speed

3.3 yards pay dirt

Self loading

Positive power steer

Electric control

85 h.p. gasoline engine

Tires { 14:00 x 32 primemover 9:00 x 16 on Carryall

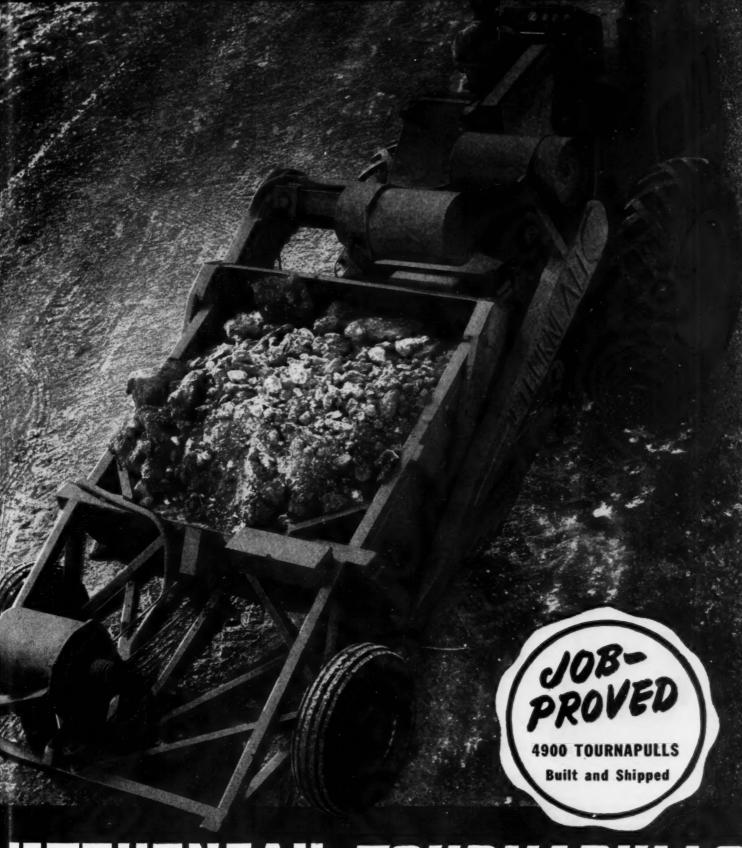
Weighs 7½ tons empty

Sparnagelly, Corryoll -m Frade Mark Rep. U. S. Pat. Off. C63



See your Le Tourneau Distributor NOW for complete information

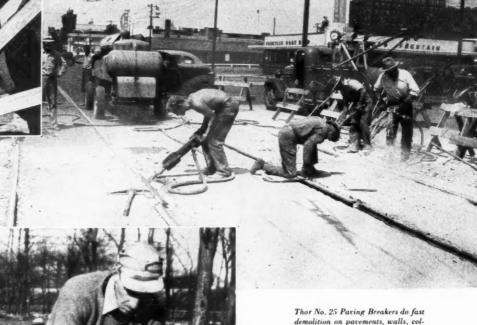
for high-speed dirtmoving



ETUURNEAU TOURNAPULLS

YOU'LL FIND THOR

Used with a sheeting driver attachment, the Thor No. 25 Breaker quickly drives wood or steel sheet-ing up to 3" thick.



demolition on pavements, walls, col-umns, piers, foundations, etc.

equi jobs doub extra get plans

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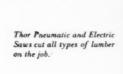
Los Ang Salt Lak



Self-priming Thor Sump Pumps, with centrifugal impeller-type construction, operate with high efficiency in oil, sludge, sewage or dirty water.



With clay spade attachment, a versatile Thor Breaker saves time and effort in trenching





TOOLS ON MORE JOBS



Thor No. 75 Rock Drill-one in a range of sizes for general purpose drilling in all rock

> Thor contractors tool accessories for digging, tamping rock breaking, asphalt cutting, driving, sheeting etc.

Thor Tools appear on more jobs because contractors equipped with Thor can bid for more jobs-and get more jobs done faster! They can figure ahead on practically doubling the output of their gangs for any job with the extra power and handling ease of Thor Tools that naturally get more work done quicker. Figure Thor in your '47 plans—call your Thor dealer today for complete information.

INDEPENDENT PNEUMATIC TOOL CO.

600 W. Jackson Blvd., Chicago 6, III.

Los Angeles Salt Lake City

Milwaukee New York Philadelphia San Francisco

Buffalo Cincinnati Cleveland Denver Pittsburgh Toronto, Canada

St. Louis St. Paul London, England







FOR THE FIRST TIME IN FOUR YEARS WE BRAND WIRE ROPE. IMMEDIATE DELIVERY TIGER COUNTS. ON FAMOUS EXCELLENCE PROMPTL DON'T GET YOUR YEAR. REMEMBER PLACING BUSY FOR DOWN: PREPARED BRAND YOUR TIGER TODAY. FOR SUPPL DEMAND ROPE WIRE YOUR

AMERICAN STEEL & WIRE COMPANY Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY

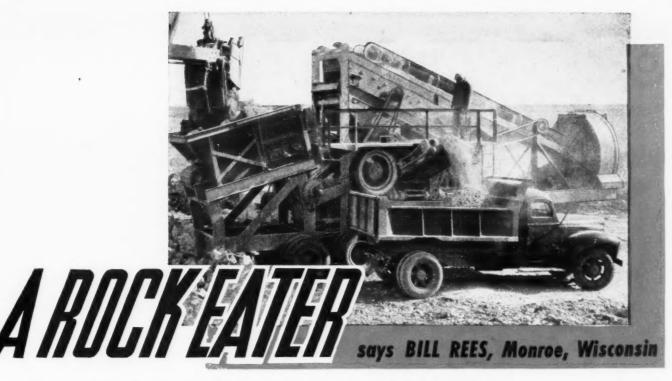
San Francisco

Tennessee Coal, Iron & Railroad Company, Birmingham, Southern Distributors United States Steel Export Company, New York

UNITED STATES STEEL



The BIG Demand is for Tiger Brand



More than 2 yards of ¾" per minute with Universal 293-Q Pacemaker Senior Portable Quarry Plant

"In my opinion, the Universal 293-Q Pacemaker is the finest portable rock plant built. It consistently produces 125 yards of 34" material per hour from rock with a wearing test of 41.3. It can be moved from the quarry for dynamite shots and be back in operation in 22 minutes. On one occasion we moved the entire plant 28 miles and were set up and crushing to capacity in 4 hours. We have produced over 300,000 tons with no expense other than normal operation and maintenance costs which have been unusually low."

"Stream-Flo" Engineering and Twin-Dual Rolls Provide Amazing Capacity at Low Cost Per Ton

Featuring three stages of reduction with only two crushers, the 293-Q Pacemaker shovel-loads direct from quarry, increasing profits by eliminating the expense of quarry trucks and costly ramps. Once you start feeding rock into its sturdy shovel-loading hopper, material flows in a steady stream to save time and cut operating costs. The complete plant consists of a jaw *usher, Twin-Dual roll crusher, 2½-deck gyrating screen, apron feeder, bar grizzly and by-pass, under conveyor, Rotovator, and return conveyor. These units, combined with all auxiliaries necessary in a smooth, well-balanced plant, are mounted on a dual pneumatic tired gooseneck truck equipped with mechanical brakes and rear wheel equalizers.

For capacity to tackle largest jobs, for portability to handle small contracts profitably, investigate the Universal 293-Q Pacemaker now. Learn how "Stream-Flo" Engineering gives you higher capacity, ready portability, and lower costs per ton. Your nearby Universal distributor has the facts or write for full information.

WRITE FOR BULLETIN No. 31

293-Q FLOW OF MATERIAL SET CONSTOR CONTROL SET CONSTOR SET CONSTOR

UNIVERSAL

ENGINEERING CORPORATION
327 Eighth Street N.W., Cedar Rapids, Iowa

MORE TONS PER HOUR-LESS COST PER TON

ENGINEERS AND BUILDERS OF "STREAM-FLO" ROCK, GRAVEL, AND LIME PLANTS – SCREENING AND WASHING PLANTS – CONVEYORS – APRON FEEDERS

PARSONS TRENCHLINER* ELIMINATES COSTLY HANDWORK





Trench Next to Walls Without Hand Work

Parsons Trenchliner digs at top efficiency within just a few inches of walls, fences, telephone poles. Boom shifts across entire width of Trenchliner — easily and smoothly, because it rides on large diameter rollers. Shifting boom permits Trenchliner to sidestep obstructions that stop other trenchers, saves money on sections of trench that formerly were 100% costly hand work.

Pipe Across Trench Is No Problem

Trenchliner digs up to pipe, then over, then slides boom under pipe. Hand work is virtually eliminated.

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Clean Bottom, Straight Walls

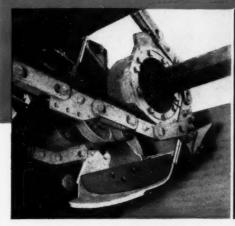
Trenchliner ditches are uniform, the width you need at the depth you want, straight-walled, round-bottomed, ready for pipe with minimum hand work.

PARSONS

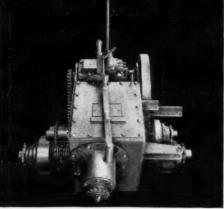
COMPANY

Newton, lowa . Koehring Subsidiary

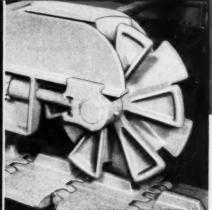
Eliminates Costly Maintenance Hand Work



SELF-CLEANING BUCKETS—No hand work. Buckets are scraped out automatically by spring-cushioned cleaner. Each bucket gets a big bite . . . all pay dirt . . . because bucket is always clean.



OIL CHANGED ONLY TWICE A YEAR — Even under continuous operation. All gears activating operations of Parsons Trenchliners enclosed in one oil-tight case, in continuous oil bath.



PROTECTED AGAINST ABRASIVE WEAR — Entire crawler assembly is self-cleaning. Main machinery is well shielded from bucket line spill . . . stays clean . . . moving parts throughout are protected.

Full Batch Discharged in 7 Seconds



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Kwik-Mix Dandie Concrete Mixers

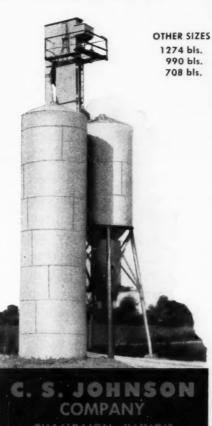
Tilted Flow-Line Discharge Chute, exclusive on the Kwik-Mix Dandie line of concrete mixers, reaches deeper into the drum, intercepts tumbling concrete at just the right angle to maintain natural flow-line in discharge. Kwik-Mix Dandie mixers are available in the following sizes: 3½-S, 6-S, 11-S, 16-S.

KWIK-MIX
COMPANY
PORT WASHINGTON, WISCONSIN

Top Capacity plus Full Portability

Johnson Twin-Silo Bulk Cement Plant

Johnson Twin Silo bulk cement plant, stores as much as 1550 barrels of cement, yet is fully portable. Welded construction speeds erection.



Enclosed Gears Run in Continuous Oil Bath



Koehring 304 Heavy-Duty Pullshovel

Heavy-Duty leader in the ¾ yard class. An excellent tool for the trenching jobs where wide sloped trenches are required or where nature of material to be excavated calls for shovel digging. Maintenance time cut in half, because all gears are enclosed, run in continuous oil bath. Anti-friction bearings require lubrication only twice a year.

KOEHRING
COMPANY
MILWAUKEE 10, WISCONSIN

"Gulf Products

and Fine Service help us get more hauls, fewer overhauls"

SAYS SUPERINTENDENT JOHN WILKINSON



THERE'S a tremendous squeeze today on U. S. construction men—jobs are usually marked rush, costs are up, and new equipment is hard to get. So these are the orders of the day on most construction projects: Make equipment operate more efficiently, last longer!

Here's how to get effective help along these lines on your jobs: Call in a Gulf Lubrication Engineer and ask him to recommend the proper lubricants and fuels for each unit of your mech-

anized equipment. From Gulf's complete line, he will select oils and greases with higher lubricating value and long life — lubricants that provide maximum protection to your equipment under every operating condition. And, he will recommend fuels that insure full power and efficiency.

Join now the hundreds of leading contractors who specify Gulf quality lubricants and fuels as a profit insurance measure. Write, wire, or phone your nearest Gulf office today.



Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

Designed for FASTER and EASIER OPERATION . . . where the Going is TOUGH!

UNIT 1020

34-Yard Shovel



Here are three time-tested UNIT machines that continue to "make the headlines" because of their unusual speed, efficiency and all-around dependability. Check the following exclusive UNIT features: Compact, streamlined design... Straight line engine mounting... Drop forged alloy steel gears... Automatic traction brakes... Interchangeable disc type clutches... One-piece cast gear case... and above all, UNIT's safety-promoting FULL VISION CAB. No other excavator on the market has all these features.

CONTACT FACTORY DIRECT for Price and Delivery

ALL Unit Models are Convertible to ALL Attachments

1/2 - Yard Dragline

UNIT 357

5-Ton Mobile Crane with Magnet Attachment.

THE WATER

6305 W. BURNHAM ST. MILWAUKEE 14, WISCONSIN, U.S.A.

UNIT CRANE & SHOVEL CORP.

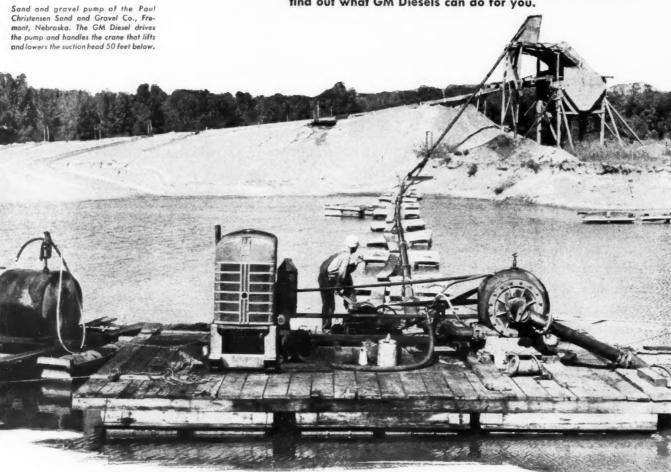
Years mean little to a GM Diesel Here's old No. 167, an engine mad of its life, it powered a truck. Since

Here's old No. 167, an engine made years ago. For the first part of its life, it powered a truck. Since 1941, it has been mounted on a barge, working at another tough job.

Belted to a 6" centrifugal pump, No. 167 is sucking up tons of sand and water from a depth of 50 feet and tossing it high into a sand hopper on the beach.

It's a good example of how these General Motors Diesels, with power at every downstroke, stand up and take any job in their stride. Any owner will tell you about their economy both in fuel and maintenance—their ease of starting, and their quick pick-up under load.

All kinds of construction work can use efficient, portable power like this. So whatever the job you have, be sure to find out what GM Diesels can do for you.

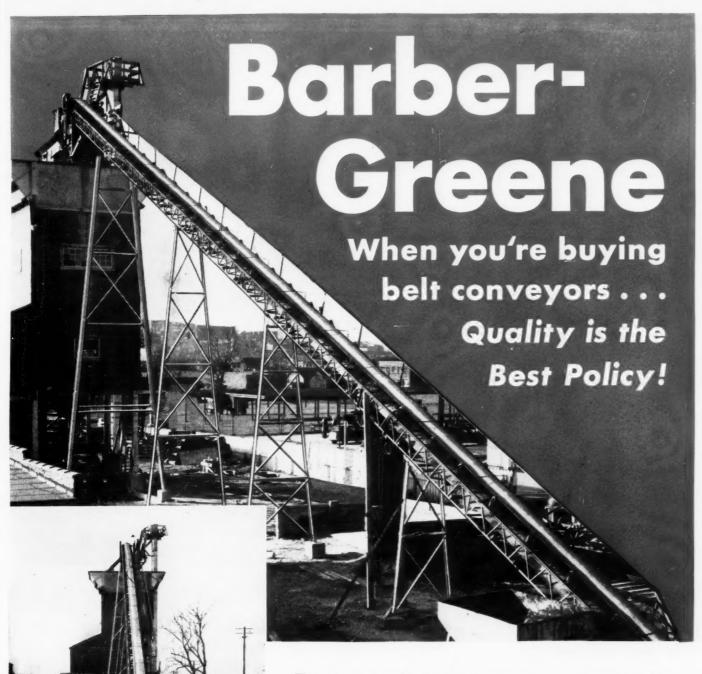




DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. 0 | SINGLE ENGINES .. Up to 200 H.P. GENER RALMOTTIPLE UNITS .. Up to 800 H.P.

DIESEL BRAWN WITHOUT THE BULK



Belt Conveyors by Barber-Greene are examples of infinite attention to engineering detail. You see this from the minute they arrive: the plainly numbered carriers and support members, the easily followed erection print, the simplified assembly on the job that comes from their standardized design. The units themselves—carriers, trusses, walkways, drives and takeups—go still further in proving the value of belt conveyors that are quality engineered. They are designed to last through longer years of service. And they do just that—while moving bulk materials at a high production pace at a low cost per yard moved.

This B-G Belt Conveyor set-up makes efficient use of limited space: materials dumped into pits below tracks are carried to plant adjacent to spur.

BARBER-GREENE COMPANY · AURORA, ILLINOIS



LOADERS

PERMANENT CONVEYORS

PORTABLE CONVEYORS

COAL MACHINES

BITUMINOUS PLANTS

FINISHERS

DITCHERS



2 Ways RED LEAD NEUTRALIZES ACIDS ... Retards Rusting

Those responsible for making metal last have long accepted Red Lead as the "standard" metal protective paint.

Now scientific research discloses sound reasons why Red Lead gives plus protection. For example, one important factor is Red Lead's ability to counteract the acid conditions which accelerate rusting.

Red Lead accomplishes this in two

1. Red Lead Counteracts Environmental Acids: The uses to which structural steel is put normally expose it to acid environments. For one thing, it is usually subjected to the attacks of industrial gases and smoke. Certain of these, in contact with moisture, produce acid-forming compounds that speed up rusting. Then, too, pollution of waterways also results in acidity. Red Lead effectively neutralizes all such acids, and thus counteracts their rust-accelerating effect.

2. Red Lead Controls Inherent Acids: Many paint

vehicles, such as linseed oil, synthetic resin varnishes and other commonly used types. themselves produce organic acids during the natural process of ageing. Many of these inherent acids, too, hasten corrosion. However, when Red Lead is the pigment in a metal protective paint, this rust-causing acidity is kept in check. Thus, a "controlled" acid level is maintained in the paint film. This is a singular property of Red Lead and contributes greatly to its film flexibility, impermeability and long life.

Remember that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including the fast-drying resin types.

Specify RED LEAD for ALL Metal Protective Paints

The rust-resistant properties of Red Lead are so pronounced that it improves any metal protective paint. So, no matter

what price you pay, you'll get a better paint if it contains Red Lead.

WRITE FOR BOOKLET: "Red Lead in Corrosion Resistant Paints" is an authoritative guide for those who specify and formulate metal paint. It also includes typical specification formulas. For your copy, address nearest branch listed below.

The benefit of our experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 8; Chicannati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7. (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va., (Evans Lead Division).



Page 28—CONSTRUCTION METHODS—March 1947

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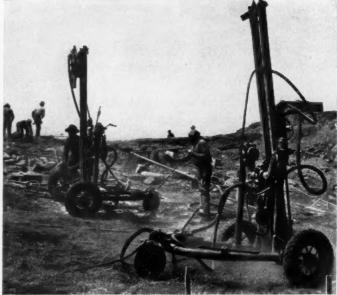
Get Car files-i

.Bucket selection made



BLAW-KNOX CONSTRUCTION EQUIPMENT





Bringing Life-Giving Water to California Farmers

Through these bleak, arid channels will soon flow precious water to growers of grapes and other produce in California. The rock drilling shown here is part of a vast irrigation project which, when finished, will be of priceless value to farmers of Kings, Tulare, and Kern Counties.

This, the Friant-Kern Canal, will wind through the fertile heart of the Golden State, carrying water southward from Friant Dam to Bakersfield. In digging this giant ditch, contractors are meeting their ancient enemy, rock—tough, age-old granite that must be drilled and shot to facilitate the excavating work.

Bethlehem Hollow Drill Steel is, of course, a familiar and necessary item of equipment. Here, as on countless other jobs where rock has been cut to powder by this shock-resisting steel, Bethlehem Hollow is doing he-man's work, day after day, for some of the leading contractors.

Ask for it by name whenever there's rock to be drilled—in mining, tunneling, road-building, and excavating work.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

DRILL STEEL



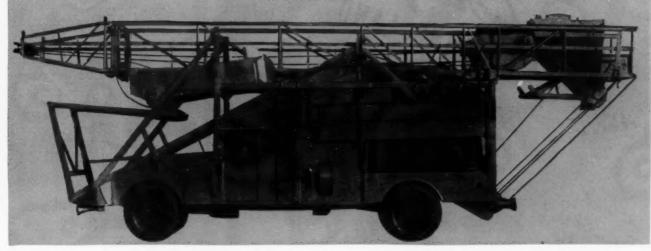
MIXERMOBILE

MIXES AND HOISTS CONCRETE

A truck-mounted mobile concrete plant containing a self-loading skip, 2-yard mixer and an elevating tower. Can be driven to the job, and set up ready for operation in less than 30 minutes. Standard tower height is 35 feet with one 10-foot extension. Tower height can be increased further to a recommended limit of 55 feet.

ONE MAN MIXES AND HOISTS UP TO 40 YARDS PER HOUR

All controls can be handled by one man from a catwalk. MIXERMOBILE will mix and hoist up to 40 yards per hour, furnishing concrete at hopper spout continuously.





TOWERMOBILE

PORTABLE ONE-MAN **ELEVATING PLANT**

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One man drives it to the job, sets up for operation in 15 to 30 minutes, hoists and pours concrete up to 40 yards per hour. Tower is raised or lowered mechanically, up to a height of 55 feet. Elevating bucket is interchangeable with 6' x 6' platform, converting TOWERMOBILE into an efficient lift for other building materials.

Write Dept. CM for complete information

MIXERMOBILE MANUFACTURERS

6855 N.E. Halsey Street

Portland 16, Oregon



AT A PROFITABLE CLIP

Drainage and reclamation of lowlands near a Western Michigan lake goes ahead swiftly and cleanly with this powerful Model 25 BAY CITY Shovel leading the way through 7000 yards of muck and sand that must be removed. Equipped with a $orall_{2 ext{-yard}}$ dragline bucket on a 30° boom, this BAY CITY clears the way on lake shore development for the contractors, Gettman Brothers of South Haven, Mich.—easily, with no strain to machinery or operator. Get busy with BAY CITY equipment on your own material handling projects. For full particulars see your nearest BAY CITY dealer or write direct to BAY CITY SHOVELS Inc., Bay City, Michigan.

SHOVELS . DRAGLINES CRANES . HOES . CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from 1/8 to 11/4 yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.

MULTIPLEX Radial Arm Saw



with the versatile

The versatility of the MULTIPLEX is amazing. Its performance cuts building costs -- saves time and manpower in any wood working operation. Just a few of its outstanding features —

- Saw directly connected to motor shaft can be operated on any angle or plane.
- More mitering capacity -- will handle left hand miters as well as conventional right hand miters.
- Ball bearing mounted yoke moves with exceptional ease.
- All controls within easy, safe reach.

 Miter, rip and bevel scales accurately calibrated -- read without eyestrain.
- Rugged construction throughout.
 One MULTIPLEX will perform almost any woodworking operation.

Write for further information and name of nearest dealer.

Optional Conversion: A Versatile Radial Arm Drill Press quickly and easily attached provides exceptional flexibility in drilling, shaping, carving, planing, routing and other operations.

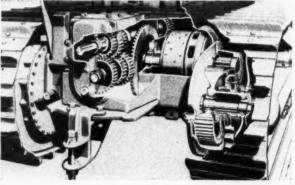
RED STAR PRODUCTS, INC. 3455 VEGA AVENUE, CLEVELAND 13, OHIO U. S. A.

The Whole Point of this Program is:



CORRECT LUBRICATION

for every part of every machine you operate



Socony-Vacuum offers: lubricants specially designed for ground breakers, air tools of all kinds—to give maximum protection against wear and rust; correct oils to meet specialized requirements of high-speed Diesel and gasoline engines—to protect against corrosion, keep them cleaner; the exactly right lubricants to protect all types of gears and bearings against heat, friction, wear. For every part of every machine on every job, Socony-Vacuum can recommend the technically correct lubrication for maximum efficiency, low repair costs!

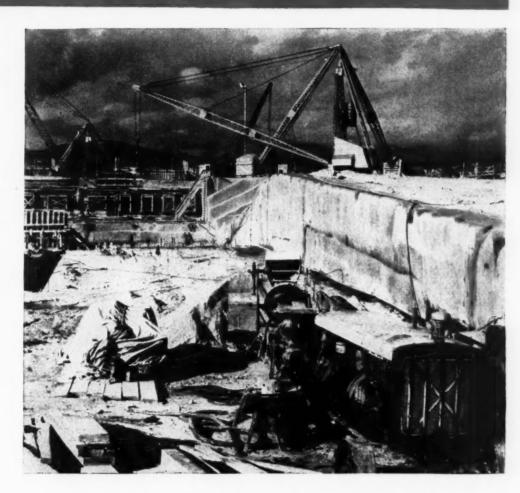
Relyon SOCONY-VACUUM CONTRACTORS' SERVICE

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation

MEET OR BEAT YOUR DEADLINE!

TIME-SAVING SERVICE

> for all divisions of your operation

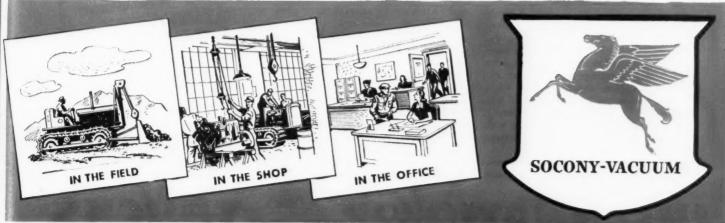


HERE ARE just a few of the ways we help you ease tight work schedules, meet and beat contract deadlines:

- 1. Supply you with tested maintenance schedules adapted to *your* equipment, *your* set-up;
- 2. Give you practical help on "problem" machines;
- 3. Provide information on the Do's and Don't's of Correct Lubrication;
- 4. Supply the requirements for oils and greases for all of your equipment.
- 5. Help simplify lubricant inventory problems.

+ + +

On the job, in the shop and in the office . . . all through your operation, this service saves valuable time! See your Socony-Vacuum Representative today for full details.



Tune in THE MOBILGAS PROGRAM - Monday Evenings, 9:30 E.S.T. - NBC

NOW!

The Finest Values in 40 Years of International Truck History

New

INTERNATIONAL

Trucks



For 16 years more heavy-duty International Trucks have served American commerce and industry than any other make.

Now come new KB Models – light-duty, medium-duty and heavy-duty – with gross vehicle weight ratings from 4,400 to 35,-100 pounds. Note the designation – KB.

That means many features and improvements...new goals in engineering, research, and design...new styling with trim, flowing lines accented by gleaming chrome.

And that means rugged International stamina, long, trouble-free life, and ease

and economy of operation in greater abundance than ever before.

Yes, KB Internationals are the finest trucks in 40 years of International Truck history. In the complete line is the right truck for every job. And back of every truck is service as great as the trucks themselves, supplied by the nation's largest company-owned truck service organization—International Branches—and thousands of International Dealers.

Motor Truck Division INTERNATIONAL HARVESTER COMPANY 180 N. Michigan Ave., Chicago 1, Illinois



THIS EMBLEM
IDENTIFIES
GREAT TRUCKS



Tune in James Melton on "Harvest of Stars" every Sunday! NBC Network. See newspaper for time and station.

INTERNATIONAL



TRUCKS



3/4 Yd. Machine

Power, strength, mobility, lifting capacity, adaptability—you get more of each in the ³/₄ yd. Lorain-41 than in other units of like capacity.

Check the features listed here—score them point for point against the field in the ³4 yd. class. You'll get the same answer as have hundreds of other shovel and crane users—the Lorain-41 has more "capacity for profits"

than any machine of its class. See your local Thew-Lorain distributor for complete information now!

THE THEW SHOVEL COMPANY

TURNTABLE FEATURES

Simplified Center Drive direct-to-thepoint power application on turntable.

Sloping machinery frame places machinery far back of tipping point where it counter-balances loads for maximum lifting ability.

Roller bearing mounted Swing Drums, actuated by long life shoe clutches.

Steel Erector's Precision Boom Hoist, with "Micrometer" power control of boom lowering (on cranes).

Easily assembled pin-connected crane booms, with center sections and extension tips.

Independent, positive chain crowd shovel boom.

"Cable-Miser" dragline fairlead prolongs cable life.

CRAWLER FEATURES

Heavy-duty chain drive.

2 travel speeds—in both directions provided as standard equipment, no extras.

Crawler steers from operator's position with turntable in any position of swing.

A positive 4-way tread and travel lock.

Drop forged treads, 30" wide, swamp type, self-cleaning.

Thew Thew of In

How to pick the RIGHT SCRAPER



In times like these it's doubly important to consider every piece of equipment strictly on its own merits. This is especially true of tractor-drawn scrapers because regardless of what make of crawler tractors you use, it's the scraper that handles the "payload," which in turn controls your profit on every job. To make the most profit then, it naturally pays to pick the scraper that will move the most yardage at the lowest cost under the widest range of job conditions.

While you hear a lot of "claims" about scraper performance, the fact remains that on hundreds of the world's toughest earthmoving jobs LaPlant-Choate Positive Forced Ejection Scrapers are outperforming competitive rigs by a wide margin.

They're getting bigger "payloads" faster with less power . . . spreading them faster at the fill . . . and saving hours of costly "down time" for maintenance and repairs. Moreover, LaPlant-Choate rigs are getting these results in all kinds of materials including hard-to-load sand, rocks, sticky gumbo, and whatnot. So why take a chance with inferior, unproved scrapers when you can make more money under more conditions with job-proved LaPlant-Choate rigs. Get the facts from your nearest LPC dealer. LaPlant-Choate Manufacturing Co. Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, Calif.

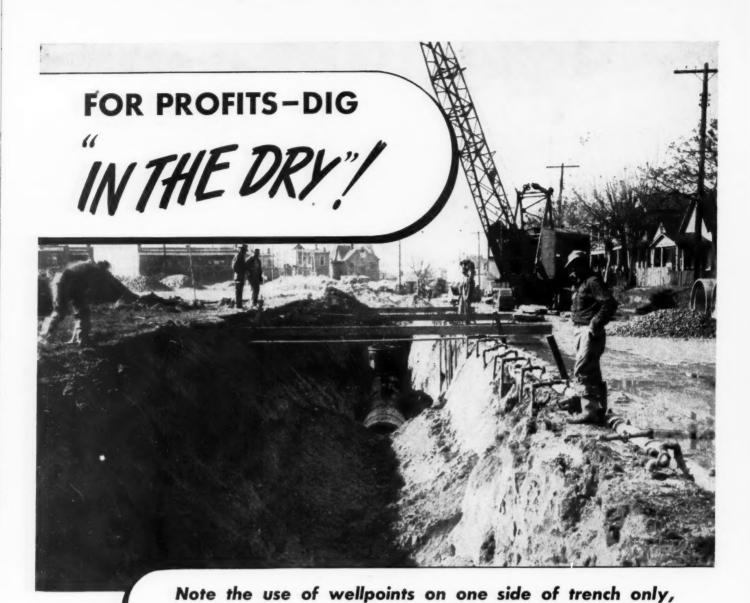


to make the MOST PROFIT!

Faster Smoother Spreading Under all Conditions

Competitive
Tests Prove
LaPlant-Choate
Best!





JOBS—plenty of them coming out for bids soon. Many will be wet. And the way to handle a wet job profitably is to let a MORETRENCH

WELLPOINT SYSTEM

take care of the water.

MORETRENCH can give you the best in equipment, engineering, and supervision. We'll appreciate the opportunity to demonstrate that we can save time and money for you on your next wet job.

Catalog Sent on Request

and the absence of sheeting on this trunk sewer project.

MORETRENCH CORPORATION

90 West St. New York 6 3037 5. Christiana Ave. Chicago 23, Illinois 2424 Chicago Ave Tampa 6, Florida 315 W. 25th St. Houston 8, Texas Rockaway New Jersey

At the foundations of many construction jobs Pray Philodelphia office bit of a new philodelphia office bit of a new constructor, Buckley & Co., Inc.; general contractor, Buckley

chramm Air Compressors play a vital role in construction jobs from the foundation up. Excavating, drilling, driving sheeting and a hundred and one other uses of a Schramm . . . make it the "good right arm" of construction engineers. Reliability and mobility are what these engineers demand and that's what they get in a Schramm Compressor.

From foundation to top story . . . Schramm provides a constant flow of air at the right place at the right time. Both engine and compressor are watercooled and give the same efficient operation, summer and winter. The push of a button starts the Schramm and it requires very little attention.

Schramm Compressors are available in all types of assemblies and mountings. Four other features make it ideal for all-round, all-year use in the construction fields: Main bearings for every cylinder, 2. Mechanical intake valve, 3. Multi-cylinders and lighter parts, and, 4. Forced feed lubrication.

Get the full details of Schramm advantages. Write for your copy of Catalog 45-A.

SCHRAMM, INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

Frank A. Callahan.



with . . .





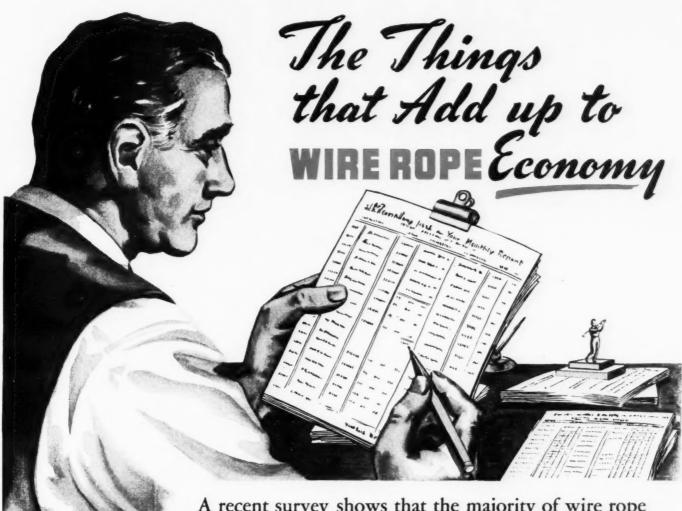


FLEET OPERATORS have put Stanolube HD in many tough spots—on heavy tonnage coal trucks in continuous operation, on large inter-city and bus fleets, on taxi operation and in door-to-door delivery service. In every type of service Stanolube HD has helped reduce engine maintenance—lengthened time between overhauls, reduced sludge, eliminated varnish and ring sticking.

Give a break to your hard-worked fleet engines... and to your maintenance men... and your pocketbook. Test Stanolube HD where you can compare its performance with that of oils previously used or with other oils now operating in your fleet. A Standard Oil Automotive Engineer will help you make a test. Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)





If you have not tried Preformed "HERCULES" (Red-Strand) Wire Rope you, too, would like its easy handling, smooth spooling and long life. Give it a chance to prove its money saving ability! We invite your inquiries.

A recent survey shows that the majority of wire rope buyers consider "Easy Handling" and "Length of Service" the two most important factors in determining final rope cost.

And more and more wire rope users are finding, by actual experience, that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for these two top-ranking features. As it is available in a wide range of constructions—both Round Strand and Flattened Strand—they have also found that in "HERCULES" there is a right rope for any heavy duty purpose.

"HERCULES"



MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

NEW YORK . CHICAGO . DENVER . SAN FRANCISCO . PORTLAND . SEATTLE

List time



ROADSTONE and **AGSTONE**

in one operation!

This portable hammermill plant is another new Cedarapids portable crushing and screening plant that opens up an entirely new market for contractors and quarry operators. The crushing unit is a 4033 or a 3033 Cedarapids Hammermill that will turn out 20 to 40 tons of agstone or 140 to 180 tons of 11/2" material per hour depending upon the size of feed and kind of stone. Or - the portable hammermill plant will produce a percentage of each product all in one closed cycle operation. The agstone comes off the delivery conveyor over the end of the plant while the crushed rock comes out on a side delivery conveyor.

In this installation, the rock is going into a five yard portable truck loading bin that acts as a surge between truck loads. Note the separate power unit for the hammermill which THE IOWA LINE

of Material Handling Equipment Includes of Material Handling Equipment Includes
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS—STEEL BINS • BUCKET ELEVATORS • VIBRAROCK AND REVOLVING SCREENS • STRAIGHT LINE
ROCK AND GRAVEL PLANTS • FEEDERS—TRAPS
STONE PLANTS • PORTABLE GRAVEL PLANTS • PORTABLE
REDUCTION CRUSHERS • BATCH TYPE ASPHALT
DRAG SCRAPER TANKS • WASHING PLANTS •
TRACTOR-CRUSHER PLANTS • STEEL TRUCKS DRAG SCRAPER TANKS • WASHING PLANIS •
TRACTOR-CRUSHER PLANTS • STEEL TRUCKS
AND TRAILERS • KUBIT IMPACT BREAKERS

permits a change of speed to suit hammermill performance in various kinds of stone.

The Cedarapids Hammermill not only produces a much finer quality and uniform size of material but will turn out more tons per hour than other similar types of pulverizing equipment of comparable size, and with less maintenance cost. Cedarapids Hammermills are available in 2033, 3033 and 4033 sizes - on skids or portable.

When you buy a crushing plant—buy the best - buy Cedarapids. See your nearest Cedarapids dealer for details.



MANUFACTURING COMPANY Cedar Rapids, Iowa, U. S. A.

AND THER TRAXCAVATOR



HERE'S the newest member of the famous TRAXCAVATOR family, the Model T-6—climax of 20 years of tractor-shovel building . . . Brings to excavating, dirt-moving and material-handling fields, a new measure of multi-purpose utility and low production costs.

It mounts on the "Caterpillar" D6 tractor and is engineered to utilize most efficiently the full power, speed and work capacity of that renowned tractor . . . over 16,000 pounds of tractive effort that digs full loads in toughest soils . . . quick reverse, unequalled visibility and sure-footed balance that spells high-

speed, low-cost digging, loading, grading and moving of earth or loose materials . . . ability to load big hauling units or small dump trucks with equal ease.

TRAXCAVATORS are the only full and complete line of tractor-excavators . . . there's a size for every job and purpose . . . and both TRAXCAVATORS and tractors are sold and serviced by your TRACKSON-"Caterpillar" dealer. See him today about the T-6 and other sizes of TRAXCAVATORS, or write direct for facts to TRACKSON COMPANY, Dept. CM-37, Milwaukee 1, Wisconsin.

TRAXCAVATORS ARE PROFIT-MAKERS

DEPENDABLE FASTENINGS for the Construction Jobs Ahead

Here are the fastenings, both plain and galvanized, being turned out by Bethlehem for the big construction jobs ahead. Tough and rugged, and made to exacting specifications, Bethlehem fastenings are the kind you can count on for dependable performance. And Bethlehem fastening engineers are always at your service, ready to discuss your fastenings problems.



DRIFT BOLTS—Furnished round or square, either headless, or with button, countersunk or square heads. Points manufactured are wedge, half or semi-cone, full-cone, no point.



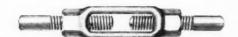
SPIKES—Easy to drive because of their sharp wedge points. Made with diamond, button, nail, countersunk and hook heads.



WASHERS—Furnished round in two styles, standard and dock. Square and rectangular washers may be obtained on special order.



TIE RODS—Supplied plain or upset in all sizes, in single or multiple units, and with cut or rolled right-or left-hand threads. Single unit rods are made in lengths up to 46 ft, but multiple units can be supplied in any length. Bethlehem also manufactures a complete range of tank- and pipe-bands.



TURNBUCKLES — Bethlehem turnbuckles are furnished in a size range to meet every requirement. Standard 6-in. openings are furnished between heads, but 12-in. openings can also be supplied.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation



CLEVISES—Made in a full range of sizes, tapped to American Standard Coarse-thread Series, Class 2. Furnished with or without pin and cotter, and with right- or left-hand threads.



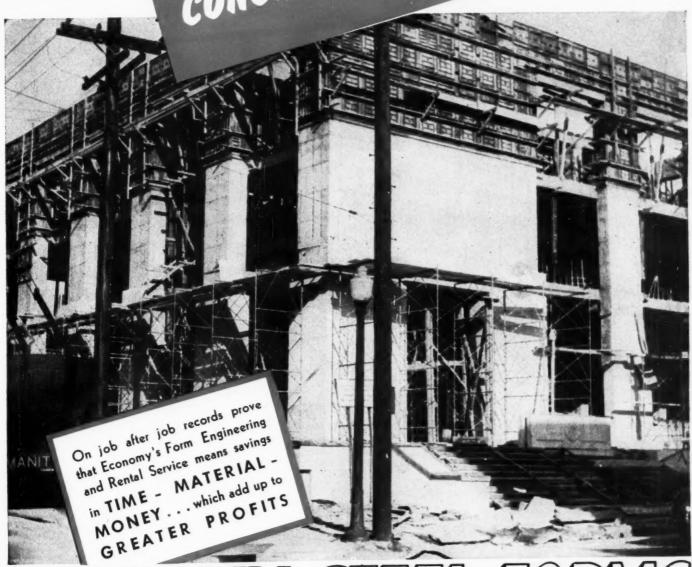
RIVETS—Furnished in all standard types, small and large.



machine bolts — Manufactured from carbon or alloy steel in all sizes. Furnished with cut- or rolled-threads, and with square, hexagon, tee, button, countersunk and hook heads. Carriage and lag bolts, as well as all types of special bolts, are also supplied in a full size range.

Bethlehem supplies every type of Fastening

FOR RENT STEEL FORMS FOR STEEL FORMS TRUCTION CONCRETE CONSTRUCTION

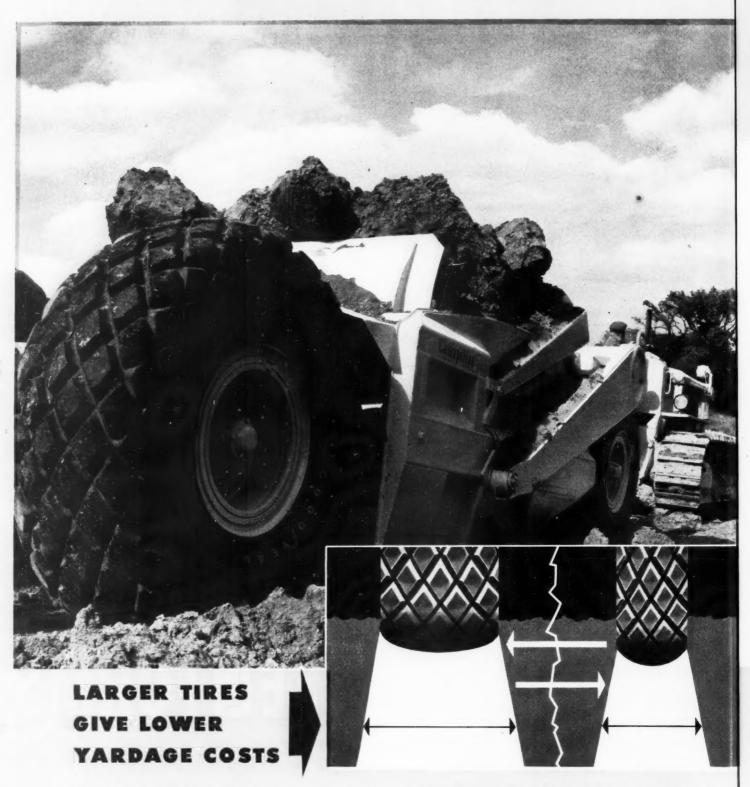


ECONOMY STEEL FORMS

A nation-wide form-rental and engineering service that saves costly material and time in concrete construction. We welcome job inquiries by letter, wire or telephone

ECONOMY FORMS CORP. . . . Home Office: Des Moines, lowa ict Offices: . Fort Wayne, Ind. . Plainfield, N. J. . Atlante, Ge. . Dallas, Tex.

"Caterpillar" equipment is



They provide—GREATER TRACTION—BETTER FLOTATION—EASIER PULL—LONGER TIRE LIFE

S NEVER UNDER-TIRED

"Caterpillar" equipment has "too little" of what it takes to do a job right and at lowest cost. It is the "Caterpillar" rule always to provide *more* than the severest operating conditions might demand.

Extra strength, extra-quality materials, extra protection against wear, are plainly evident in every "Caterpillar" part and mechanism. Take tires:

"Caterpillar" Diesel Wheel-type Tractors and Scrapers are tired for maximum production, greatest load flotation and longest tire life.

"Caterpillar" tire specifications have been worked out from the most intensive study of loads, traction, hauling speeds and surface conditions ever undertaken by a tractor manufacturer. They are engineered for the job.

Increased wheel diameters with greater tire cross-sections permit low inflation pressures under maximum loads. These features create larger "foot-print"—or bearing areas—reduce power-consuming penetration—give better traction—increase operating speeds over soft earth. Adding tire size also adds (tremendously!) to tire life on the speedier hauls over hard surfaces.

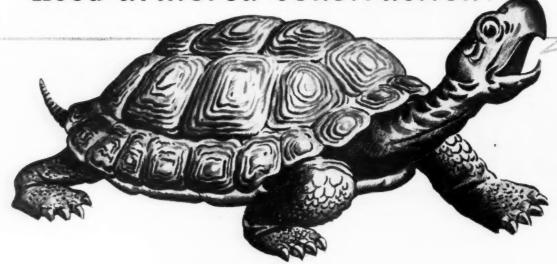
Thus, through practical engineering and job-aid recommendations, "Caterpillar" aims to make your tires as profitable an investment as the rest of your rugged, efficient and dependable "Caterpillar" Diesel Wheel-type Tractor or Scraper.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

CATERPILLAR DIESEL

ENGINES . TRACTORS . MOTOR GRADERS . EARTHMOVING EQUIPMENT

Blocks and sheaves, too, need armored construction!

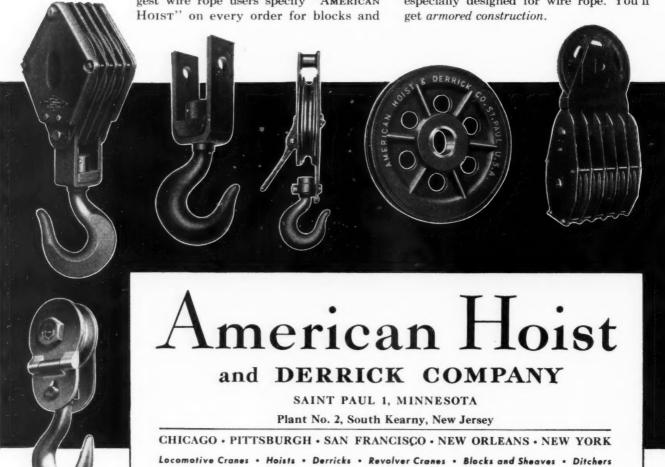


If you have to take a beating, it pays to be tough! And blocks and sheaves do take a beating. Slammed against steelwork, battered by sudden drops, exposed to the elements, dragged through sand and mud, they're either tough—or else!

That explains why so many of the biggest wire rope users specify "AMERICAN HOIST" on every order for blocks and

sheaves. For we give you armored construction. That means extra thick side plates and reinforcing straps—oversize pins and axles—hooks and shackles of tough forged steel.

Here's a practical suggestion: Specify "AMERICAN HOIST" blocks and sheaves on every order. You'll get rugged equipment especially designed for wire rope. You'll get armored construction.



Marine Deck Machinery • Car Pullers • Pile Drivers • Cane Cranes • Crosby Clips
720



Wrenches represent industry's largest hand tool expenditure!

Williams "Superior" Carbon Steel Wrenches represent industry's best "buy" because they deliver more wrench value per dollar. Drop-forged from a selected grade of carbon steel and specially processed, "Superiors" have twice the strength of oldstyle carbon wrenches. They cost approximately half as much as alloy steel wrenches, and average 93% as strong, pattern for pattern and size for size.

Available in 50 patterns, more than 1,000 sizes. Sold by leading Industrial Distributors everywhere.

J. H. WILLIAMS & CO., BUFFALO 7, N.Y.

DROP FORGED TOOLS

An Appetite for Bigger
BITES!



The new ML 4 Athey MobiLoader is designed for digging — a sturdily-built unit that gets bigger loads. Its new heavy-duty digging bucket, fast, "Finger-Tip" hydraulic control, new better balanced "Caterpillar" Diesel Tractor mounting, all add up to bigger production and easier operation on your digging and loading jobs.

Athey MobiLoaders employ the time-saving overhead method of loading. They cut time by travelling in a straightline from digging to discharging. They eliminate turning, save tractor wear and reduce maintenance costs.

Only the quality-built Athey MobiLoader gives so many profitable advantages. It's the time-proved, modern answer to your tractor-loader operations.

Your Athey "Caterpillar" Dealer will gladly tell you more about the money-saving Athey MobiLoader. See him today, or write direct to ATHEY PRODUCTS CORPORATION, 5631 West 65th Street, Chicago 38, Illinois.





"Finger-Tip" Control — A convenient lever gives operator complete and accurate command over the movement of the heavy-duty bucket. Easier operation, bigger production.

Whey ML4 MOBILOADER



Contractors on widely varied projects in many sections of the country are now using a new combination of off-the-highway tires and on-the-project service which is multiplying production schedules by slashing downtime.

This new Firestone service is basic and simple. Off-the-highway tires, specifically built for that particular type of operation, are coupled with the sound technical knowledge and experience of Firestone tire engineers who, regardless of the size of the project, personally inspect the operation under which the tires are being used. Their recommendations are helping many contractors secure the maximum hours of operation from their equipment and practically eliminate downtime due to tire failure.

Firestone tires and project service will help you raise your production schedules. For further details see your nearest Firestone Dealer or Firestone Store.

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1947, The Firestone Tire & Rubber Co.



Firestone off-the-Highway tires



A Timely Tip

THAT SAVES CONTRACTING DOLLARS

Experienced contractors have long known ARMCO Corrugated Metal Pipe as a positive aid to bigger job profits. Today the time- and labor-saving features of this durable pipe are more important than ever, and this is why . . .

Savings start the minute you begin to transport Armco Pipe to the job site. Although amply strong it is light in weight for easy handling, loading and hauling. Fewer trips and less labor are needed. Long lengths are securely joined by simple band couplers. On the job a small, unskilled crew installs it quickly without cradling, and backfilling can be done immediately. No curing and no delays to other operations. The entire job is speeded up and profits go up.

Let Armco Corrugated Pipe help you keep under the budget on that next contract. Use it for culverts, conduits, sewers, and wherever else drainage is needed. There is a type for every condition. Write for complete information. Armco Drainage & Metal Products, Inc., 1415 Curtis Street, Middletown, Ohio. Offices in principal cities.



ARMCO CORRUGATED PIPE

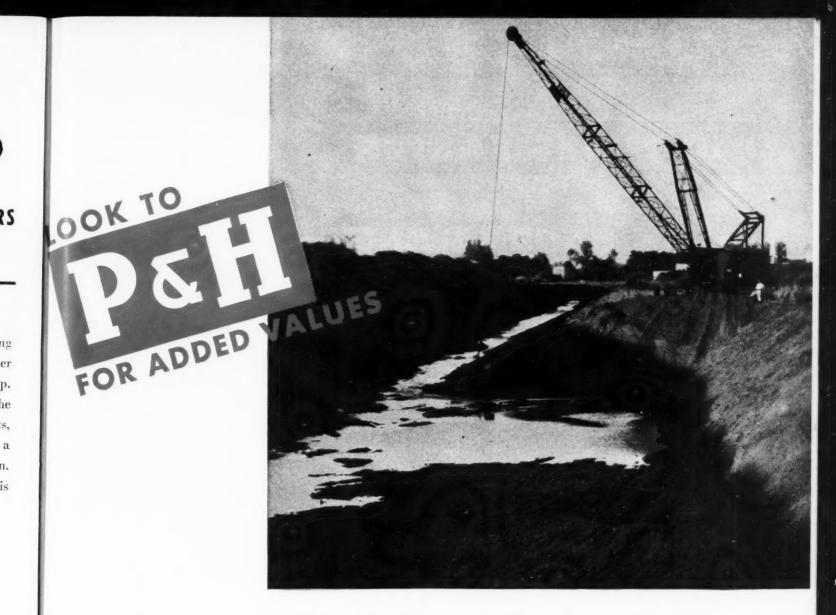


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"Slickest Swing we ever knew!"



S.

THE P&H MAGNETORQUE SWING

Electromagnetic forces transmit power for both swing and propel . . . magnetic pull instead of mechanical friction. Electric current is supplied by a small generator on the main engine - controlled from operator's station. Swinging slow or fast, has cushioned acceleration and deceleration. Swing friction maintenance is eliminated. It's another important P&H Added Value.

You'll hear owners say it again and again - wherever you find the P&H Model 1055 on the job. And you'll find them all over the country.

It's not surprising that the P&H Magnetorque Swing should be such an outstanding success. For swing clutches have always been a major source of trouble.

ELIMINATES SWING FRICTIONS

P&H removed the cause of trouble by replacing the swing frictions with Magnetorque units, mounted in the same relative position. They transmit power for swing motions without mechanical linkage, without friction without wear.

SPEEDS PRODUCTION

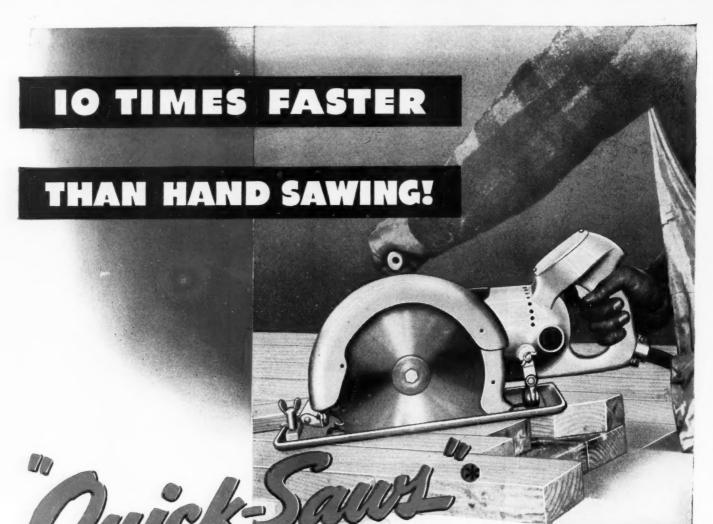
Swing is smoother, faster, more responsive. Quicker, more accurate starts and stops eliminate waste operating time—increase daily production - cut yardage costs.

NO MORE MAINTENANCE

You need never lose another day or even an hour - because of swing clutch maintenance, repair or replacement. The P&H Magnetorque unit will last the life of the machine.

Users will tell you it's one of the most important improvements ever made in the field of large excavators. That's why users won't be without it ... why they reorder. Ask for complete information.





SPEEDY and powerful, Black & Decker Electric Quick-Saws beat hand sawing 10-to-1 in all kinds of ripping, crosscutting, angles, grooves and dadoes. Rip hours off sawing jobs in wood, compo-board, slate, tile, marble, asbestos, galvanized sheet, other thin ferrous or non-ferrous metals. Perfectly balanced for easy handling that saves muscle. Built to take the rough spots without slowing up or over-heating. Cut cleanly and accurately.

Look at these features!

POWERFUL!

- Heavy-duty Black & Decker Universal Motor—specially built for Saw service.
- Heavy-duty gears and bearings deliver full power to Saw blade.

CONVENIENT!

- Operates from standard power line or portable generator.
- Complete—in convenient case—to carry to the job.

 Comfortable handles are correctly placed for working balance.

ADAPTABLE!

- Quick adjustment from minimum to maximum depth of cut.
- Angle adjustment up to 45°—calibrated.
- Blades and discs easily interchanged.

SAFE!

are your short-cut on any sawing job

- Instant-release trigger switch.
- Spring-action telescoping guard covers blade.
- 3-wire cable provides ground connection to prevent shock.

Ask your nearby Black & Decker Distributor for a demonstration of time saving Quick-Saws and the many other tools in the world's most complete line of Portable Electric Tools. Write today for your free copy of our illustrated, complete catalog. Address: The Black & Decker Mfg. Co., 659 Pennsylvania Ave., Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.





You don't pull punches any punches

. . . that is why you make more money with dependable LE ROI AIRMASTERS

The amount of work done by rock drills and paving breakers depends upon their force of blow. This, in turn, depends upon the pressure and the amount of air delivered by the compressor.

You don't pull any punches, when you use Le Roi AIRMASTERS — your air tools do more work. Here are a few AIRMASTER features that make more money for you by increasing manhour production:

The patented, fuel-saving Econotrol* adjusts engine speed to the demand for air. There is no rapid acceleration or deceleration. This results in higher average working pressures - air tools hit harder and do more.

Cushioned, super-finished AIRMASTER Valves provide the most efficient, trouble-free means of delivering air to your drills and breakers.

The new AIRMASTER Intercooler Design guarantees dry, cool, oil-free air. Hose lasts longer and does not clog your tools - permitting them to work efficiently.

The day of tough competitive bidding is at hand. Now, more than ever before, you need a dependable, low-cost supply of air that does more work for you, You need an AIRMASTER* -Portable Air Power at its Best. Sizes range from 60 to 500 cfm, gasoline- or diesel-powered - see your Le Roi distributor for complete information.

Write for bulletins.

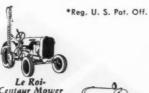
LE ROI COMPANY MILWAUKEE 14, WISCONSIN

New York • Washington • Birmingham • Tulsa • San Francisco



Heavy-duty engine

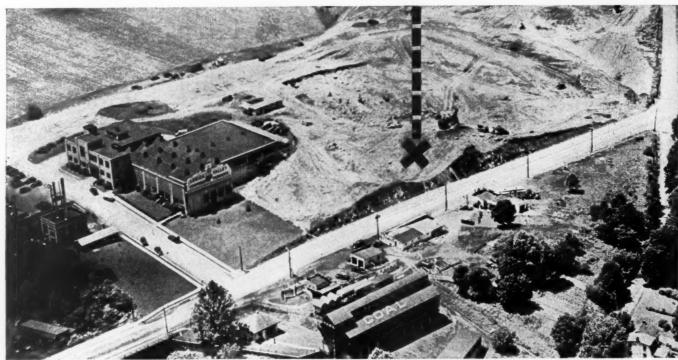






Le Roi Engine-generator set

Would You Attempt a Blast Here?



You Bet You Would! - If You Used ATLAS ROCKMASTER

the blasting system that cuts down noise and vibration

Using the Atlas Rockmaster system, highly successful blasting was done within a stone's throw of offices, stores, and houses, two hotels, a schoolhouse and a state highway-and without any serious complaint.

That's because Rockmaster usually cuts down considerably on noise and vibration, even when more holes are shot! Many actual reports show that dynamite charges do not need to be cut down because of proximity to houses when Rockmaster is properly used. And that means money saved. Shovels are kept working. Rock is well broken without so much secondary blasting.

The blasting project in the photo was at the very city limits of Allen-

town, Pa., where land was being cleared for new buildings of the Lehigh Valley Cooperative Farmers. 25,000 cubic yards of rock was blasted here by R. F. Sell, excavation contractor of Bethlehem, Pa.

There's only one way to find out whether Rockmaster can do the same for you as it is doing for blasters the country over-in construction, quarries, coal stripping and metal mining. Call in the Atlas representative and see for yourself.

With our knowledge of explosives and your knowledge of your own problems, chances are that Rockmaster can help step up your shovel efficiency cut down objectionable noise and vibration.



Manasite: Reg.U.S.Pat.Off. "ROCKMASTER"-Trade Mark

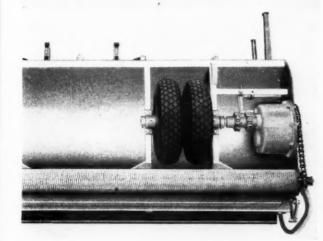
EXPLOSIVES
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address-Atpowco



SET THE FEED . . . GO ANY SPEED
Wheel shaft of spreader drives feed roll through
transmission Speed of feed roll rotation increases
or decreases in exact proportion to increase or decrease of wheel rotation. Result is an even material
feed per foot of travel as set by the shutter bar . . .
no matter how fast or varied the speed may be.
Transmission shifts for travel either forward or backward. Shutter bar adjusts for both level and taper
spread.



Spread to a constant-depth FAST with a Buckeye SPREADER

Buckeye Spreaders save you both time and material waste. Because the feeder roll rotates in exact ratio to the spreader wheels, you can go at any speed and maintain an accurate depth or volume of spread for every foot of travel. Typical application is shown above. The Spreader averaged about a mile a day in resurfacing a St. Louis county highway in Missouri. The job consisted of spreading a first course of 3/4" penetration limestone, followed by asphalt, with a final course of pea gravel. Buckeye Spreaders, conventionally used in hookups with dump trucks, may be also used for special jobs with road graders and similar equipment as shown above, left. Write for the Buckeye Spreader Bulletin for complete information.

BUCKEYE TRACTION DITCHER

Division of Gar Wood Industries, Inc.

FINDLAY

OHIO





McKiernan-Terry Pile Hammers driving Hbeam steel piles in the construction of Chicago's subway.

McKIERNAN-TERRY PILE HAMMERS

For the past half century, on projects that ranged from peacetime subways to vital war-time bridge building, these time-tested pile hammers have been proving, year in and year out, their power and dependability.

Today our increased factory capacity insures prompt deliveries on McKiernan-Terry Pile Hammers and Extractors in a complete, standardized line. We invite contractors to confer with us on any pile-driving problem.

Send for these FREE Bulletins

McKiernan-Terry Pile Hammer Bulletins No. 55 and No. 57 give detailed information, specifications. diagrams, etc. Write today for free copies for your files.

McKIERNAN-TERRY CONSTRUCTION EQUIPMENT

DOUBLE-ACTING PILE HAMMERS AND EXTRACTORS SINGLE-ACTING PILE HAMMERS PILE DRIVING RIGS HOISTING EQUIPMENT MARINE EQUIPMENT BLACKSMITHS' POWER HAMMERS

SPECIAL MACHINERY

Completely Designed, Engineered and Manufactured

Manufactured from Your Design

Full Information on Request



CORPORATION

Manufacturing Engineers

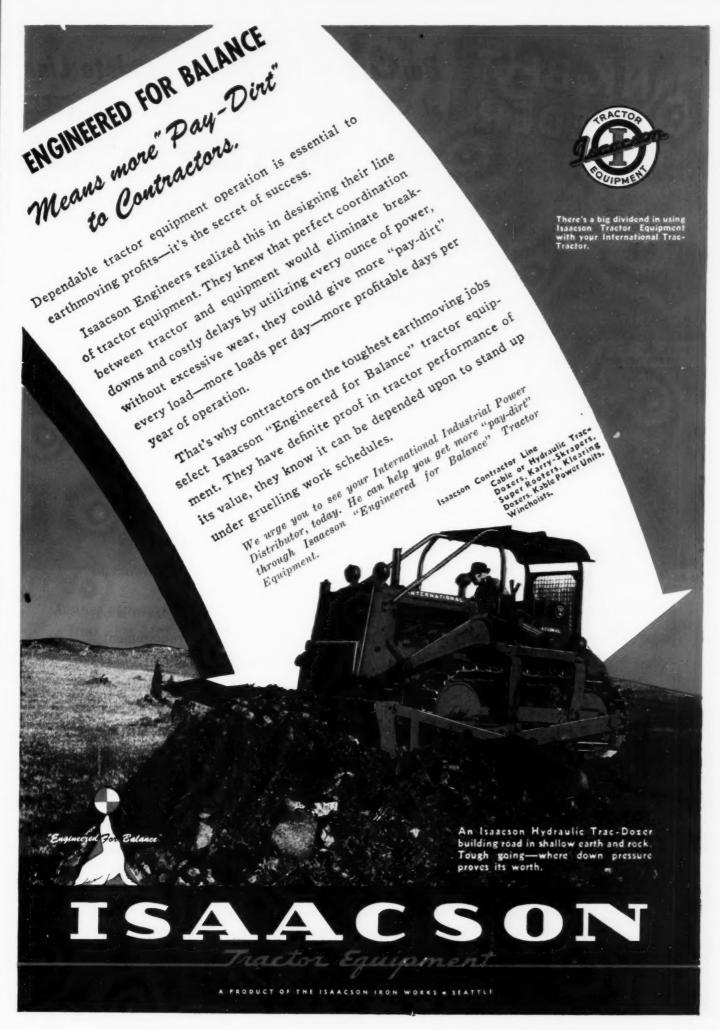
14 PARK ROW

NEW YORK 7, N. Y.

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LINK-BELT SPEEDER

Builders of the Most Complete Line of CRAWLER and WHEEL-MOUNTED "SHOVEL-CRANES"



1/2 YD.
DVEL



LS-40, % YD. DRAGLINE



TRENCH HOE



K-300 SERIES, 1 ½-2 YD. SHOVEL

K-500 SERIES, 21/2-3 YD. DRAGLINE

ZEPHYRCRANE



UC-55, SHOVEL WHEEL-MOUNTED

• In the Link-Belt Speeder line there is a size of machine to fit every requirement of the general construction industry—and every Link-Belt Speeder machine is quickly and easily convertible for use as shovel, crane, dragline, pile driver or trench-hoe. The broad range of sizes and multiple use features enable the operator of a Link-Belt Speeder to do more work, more kinds of work, more of the time!

CARGO CRANE

For Prompt, Efficient, Convenient Sales and Service: There is a Link-Belt Speeder Distributor Located Near You

LINK-BELT SPEEDER

Builders of the Most Complete Line of SHOVELS-CRANES-DRAGLINES

MODEL K-500 PEDESTAL CRANE



Amazing performance by Armstrong's New Rhino-Flex
Truck Tires—with rayon cord—assures you more
mileage, greater safety at no extra cost

ne

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NOW-you can roll your trucks on the toughest, safest tires ever built by Armstrong, leading truck tire manufacturers since 1912.

During wartime, Armstrong was called upon to develop a new, more durable tire for our fighting forces. *Rhino-Flex* carcass was Armstrong's answer. Combat reports proved it to be tougher, safer, more flexible.

Today, this great new truck tire, with tougher, tighter twisted rayon cord, is available at Armstrong dealers coast to coast. See it—compare it with any truck tire ever made regardless of price. You'll choose Armstrong for its greater strength, extra flexibility, cooler running.

Plants: Natchez, Miss. - Des Moines, Iowa - Sales Offices: West Haven, Conn.

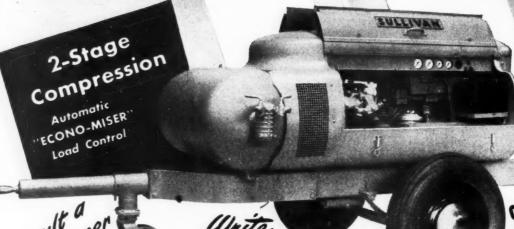


ARMSTRONG RAINS TIRES

Manufacturers of Quality Tires and Tubes Since 1912 • General Offices and Plant—460 Elm Street, West Haven 16, Conn.



SULLIVAN Series 80 PORTABLE AIR COMPRESSORS



100 P.S.I.
WORKING
PRESSURE
IN THE MOST
COMPACT PORTABLE
AIR PLANT YOU
HAVE EVER SEEN

Consult a Engineer





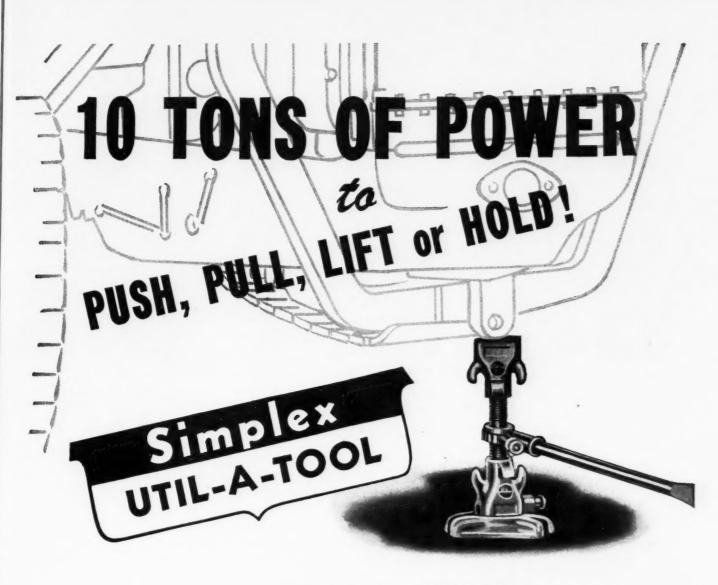
SULLIVAN

PORTABLE AIR COMPRESSORS FROM 60 TO 630 CFM

W&D C492

JOY MANUFACTURING COMPANY

General Offices: Henry W. Oliver Bidg., Pittsburgh, Pennsylvania



The Simplex line includes heavy duty Ratchet Lowering Jacks, Screw Jacks and Hydraulic Jacks to meet every construction industry need.



No. 24A — 15 Ton, Single Acting Ratchet Lowering Jack

No. 303—30 Ton, Simplex — Jenney Center-Hole Hydraulic Puller



492

Simplex, 5 to 24 Ton Simplex Malleable Base, Ball Bearing Screw Jacks • When you get a Util-A-Tool set on the job, you'll be amazed at the ease and speed with which otherwise costly, time-consuming maintenance and repair operations are cleaned up.

For example, a Util-A-Tool is ideal for lifting or lowering heavy machines, tanks, beams, etc., for installation, leveling or maintenance. It is a perfect clamp for welding in the field or in the shop. It can be set quickly to support concrete mixers, stone crushing and screening plants, and other portable equipment mounted on pneumatic tires to ease the load on the tires and to stop creeping.

A Util-A-Tool is quickly "set-up" for pulling spoked or solid center wheels and gears . . . is the fastest universal wheel puller yet devised . . . is equally efficient in pulling pinions and bushings.

Util-A-Tool sets are available for immediate delivery through distributors everywhere . . . at prices that can easily make this "Tool of a Thousand Uses" pay for itself through time and labor savings on a single job. Write for Bulletin P & P-46.

* It PULLS

* It PUSHES

* 92 SPREADS

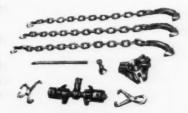
+ It BENDS

* It CLAMPS

* It HOLDS

* It LOWERS

* 9t LIFTS



Simplex LEVER - SCREW - HYDRAULIC Jacks

TEMPLETON, KENLY & CO., CHICAGO 44, ILLINOIS

Now The Final Answer





H. F. MATTHYS, BRANCH MANAGER:
"Hypoid gearing is great! So is a choice of
three interchangeable types of final drive . . .
in a wide range of axle capacities. Timken's
"3 for 1" axles are a tremendous help."

A. C. SCOTT, OWNER:
"Trucks must fit the job. New Timken "3 for 1"
axles make it easy to use the right final drive
for the job and get more efficient, more profitable operation."

W. L. SMITH, COMPTROLLER:
"I'm no authority on trucks. But I do know anything that helps fit a truck to the job will cut costs and increase profits. That's what my books show."

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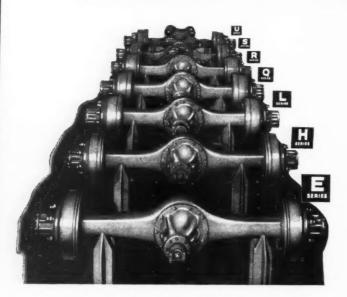
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Vehicle manufacturers, dealers, operators—everybody in the motor transportation industry—benefit from this revolutionary new Timken Axle development. It's the final answer to final drive problems.

Here's the Story, Briefly Told!

The complete new line of Timken "3 for 1" Axles, in a complete range of capacities and ratios, for medium, light-heavy, and heavy-duty service, is in full production NOW!

In every Timken "3 for 1" Axle you get your choice of three final drives—(1) Hypoid; (2) Hypoid-Helical Double-Reduction; (3) Two-Speed Hypoid-Helical Double-Reduction with Timken Easy-Power Shift. All three types of final drives in each capacity are interchangeable in the same rugged Timken axle housing, using the same axle shafts.

Consider What It Means to You!

NOW, when buying a truck, you can specify the type of final drive that best meets your job requirements. You can benefit from more efficient truck performance and longer life.

NEW TIMKEN 3/m/AXLES

to final drive problems!







CHARLES A. DENTON, MECHANIC: "The right final drive, the right axle ratio, are big helps in keeping maintenance costs down. Hypoid's a big help, too. It provides larger, stronger pinions and bearings."

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JOSEPH M. STUEBBEN, SUPERINTENDENT: "Buying the right vehicles is important. A wide range of capacities and gear ratios and three types of final drive, interchangeable in the same axle housing, are big forward steps."

E. B. LA BEAU, DRIVER:
"Drivers appreciate the value of the right final drive. It's easier on us . . . easier on the truck . . . saves time and trouble . . . makes for better driving in every way."

NOW, if your job requirements change, you can change to a different type of final drive using the same axle housing and the same axle shafts.

NOW, when you trade in a Timken "3 for 1" axle-equipped truck, you can get more for it, for this interchangeability of final drives is an advantage every operator will want.

In short, here is what you have always wanted—the ability to choose the truck that fits your job exactly—without final drive compromise or substitution.

Act now! Get all the facts on the new Timken "3 for 1" Axles! Then specify "3 for 1" axles under the next new trucks you buy!

THE TIMKEN-DETROIT AXLE COMPANY

DETROIT 32, MICHIGAN

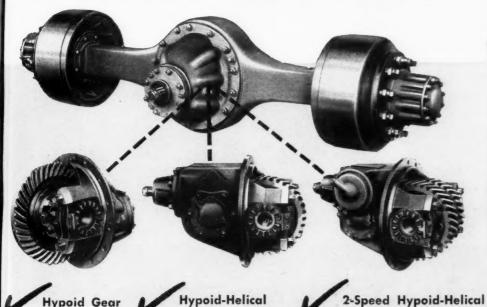
WISCONSIN AXLE DIVISION, OSHKOSH, WIS.

TIMKEN AXLE BRAKE DIVISION, DETROIT, MICH.

Double-Reduction



Timken offers for the first time the full advantages of Hypoid Gearing in a complete line of axles: a wider range of gear ratios . . . increased torque capacity . . . sturdier gear mounting . . . longer life and increased dependability.



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- Seven new related series of axles, providing a complete range of capacities for all medium, light-heavy and heavy-duty requirements.
- 2 Three optional types of final drive in each capacity, each interchangeable in the same axle housing using the same axle shafts.
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- 4 New Advanced-Related Design, with exclusive Timken Hypoid "Hy-Performance" Gearing throughout the entire line.



America's Most Complete Line of Material Handling Buckets

SHOVEL PULLSHOVEL purpose DRAGLINE CLAMSHELL

• FRONTS, BOTTOMS, SCOOPS AND TEETH are 14% manganese steel developing tensile strength up to 120,000 p.s.i. This high percentage manganese steel gives tough, rugged strength for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

Experience Counts

See your shovel man or equipment dealer about PMCO Buckets and Dippers.

Clamshell Sizes 3/8, 1/2, 3/4, 1, 1 1/2, 2 yds.

> Pullshovel Outside Cutter Widths -31"—36"-39"

Dragline All Purpose Sizes 3/s to 2 yds. Stripping sizes 2 to 9 yds.

Shovel Sizes 3/s to 18 yds.

"Quality Since 1880"

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

On the 1/2 yd. and 34

yd. Shovel, Pullshovel Bucket and Dragline

Buckets, all teeth are

interchangeable great advantage operators.



Pouring full loads up to 18½ feet above ground level . . . maneuvering in tight spots . . . operating fast and easily on jobs impossible for most concrete pavers is routine for MultiFoote Elevating Boom Pavers. This is a concrete paver that can do a real job on all types of concrete construction work, as well as on straightaway paving . . . A machine that is big enough for the big jobs; and so economical in operation that small jobs are profitable, too.

The MultiFoote Elevating Boom is built for continuous operation on high pouring. Oversize clutches and brakes and special hoist transmission make this unit as dependable in use as the rest of the simple rugged MultiFoote Paver features.

Get full details from your MultiFoote Dealer—or write direct. Remember: Multi-Foote Elevating Boom Pavers are the only pavers built for continuous high pouring service.

THE FOOTE COMPANY, INC.

1910 State Street Nunda, New York MULTIFOOTE
CONCRETE PAVERS



a thousand and one

MACWHYTE WIRE ROPES

...all job-proved...assure you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

MACWHYTE WIRE ROPE

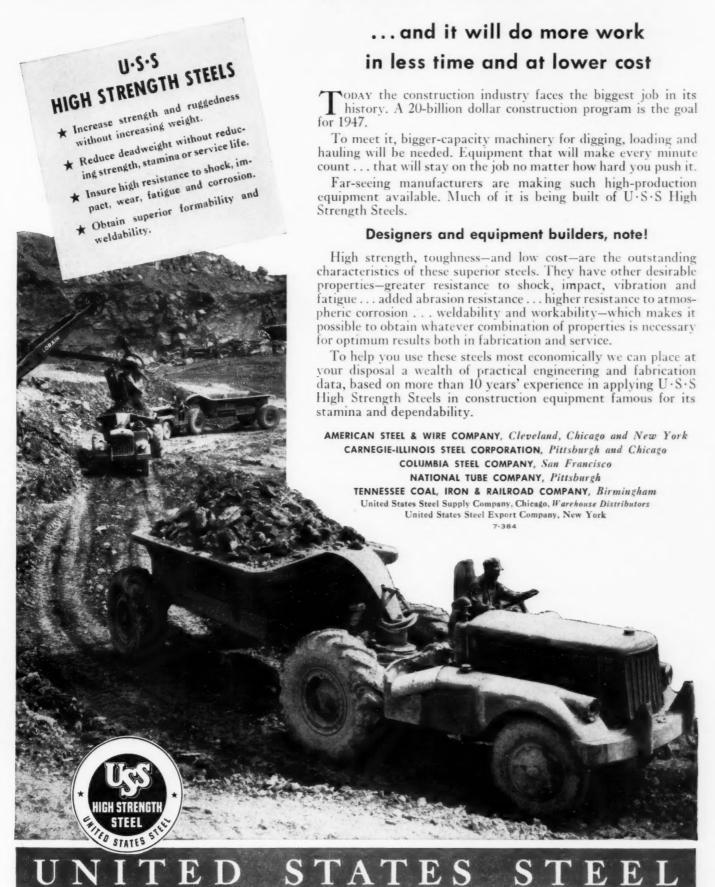
Manufactured by Macwhyte Company 2941 Fourteenth Ave., Kenosha, Wis.

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MACWHYTE PREFORMED AND NON-PREFORMED INTERNALLY LUBRICATED WIRE ROPES.. MONARCH WHYTE STRAND Wire Rope...Special Traction Elevator Rope...Stainless Steel Wire Rope...Monel Metal Wire Rope...Galvanized Wire Rope...Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies and Tie-Rods. Catalogs on request.

Build your earth-moving equipment with these *more efficient* steels



THE BUTLER ENGINEER

A Thorough Knowledge of Many Fields

that He May Know His Own CONCRETE PRODUCTS

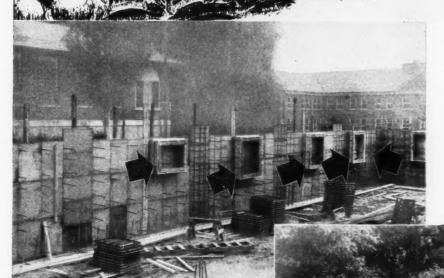
The Butler Engineer must have an intimate knowledge of the practices, methods and problems of
many industries and many fields . . . That he has
this knowledge is the reason Butler equipment is
known and used throughout the world.

BUTLER BIN COMPANY

Performance counts In <u>ANY</u> Business

In the construction industry, performance pays off. If a product helps build better, faster and more economically ... if it can meet exacting standards of performance ... if it will stand up to hard use ... it's "IN."

UNI-FORMS are a widely used construction tool. These steel-framed, plywood faced panels combine the advantages of steel forms with the all-important feature of wood forms . . . a nailing surface for window bucks, box-outs, conduits, ducts, etc.



AT LEFT—Arrows indicate reinforcing steel in place . . . Window bucks, box-outs, etc. are nailed directly to the plywood face of the UNI-FORMS. Note how one side of the form is completely erected and how easily attachments and reinforcing steel, etc. can be placed. THIS MEANS IMPORTANT TIME AND COST SAVINGS.

RIGHT-UNI-FORM Panels are erected to form one side of this residential foundation. Window bucks, box-outs can be readily nailed to the forms, and the other side of the form erected. UNI-FORM Ties visible here, lock the panels into a rigid, accurately spaced form which requires alignment on one side only.



The UNI-FORM System of Wall Form Construction is a complete, ready-to-use system of forming concrete which requires no nailing or bolting of forms. It has the lowest material and labor cost of any method . . . it assures smooth walls of uniform thickness . . . it can be used for every type of concrete construction.

Other UNIVERSAL Products include:

Concrete Forms • Form Ties • Brick Ties
Reinforcing Steel
Supports and Building Specialties

Better Service Wherever You Build



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Fire Chief Canvas . . . could have prevented this fire.

An overturned salamander . . . live sparks falling on a canvas tarpaulin . . . the untreated canvas ignites and disaster follows.

With Fire Chief Finished canvas it would have been different. Fire Chief will not support combustion. The canvas may char a little where the spark contacts it, but will not flame, soon goes out.

On all construction work, the few extra cents for Fire Chief Finished Canvas is cheap in-

surance . . . soon repaid by longer use, for Fire Chief is water, weather, mildew and wear-resistant, too.

Wherever flammable canvas presents a hazard, specify Fire Chief. Approved by both the Underwriters Laboratories and the Associated Factory Mutual Fire Insurance Companies.

WM. E. HOOPER & SONS CO.

New York PHILADELPHIA Chicago

Mills: WOODBERRY, BALTIMORE, MD.

"Fire-Chief" Finished

U. S. Patent No. 2,299,612 and other patents

HOOPERWOOD COTTON DUCK



GET this high-hour husky on drive wheels where pulling power is your top requirement. It's Goodyear's great Sure-Grip, and it packs pull-ahead traction like no other work tire. Its open center self-cleaning tread keeps each lug bar completely separate. So each lug bites in deep, takes firm grip with minimum slip, pulls sure and steady in any going.

That's why the Sure-Grip is first choice wherever pulling power is the first need. And when you add in the low-cost, long-life performance typical of all Goodyear work tires, you see why Goodyears stay first choice — why year after year, more yards are moved on Goodyear off-the-road tires than on any other kind!

THE RIGHT TIRE FOR EVERY JOB



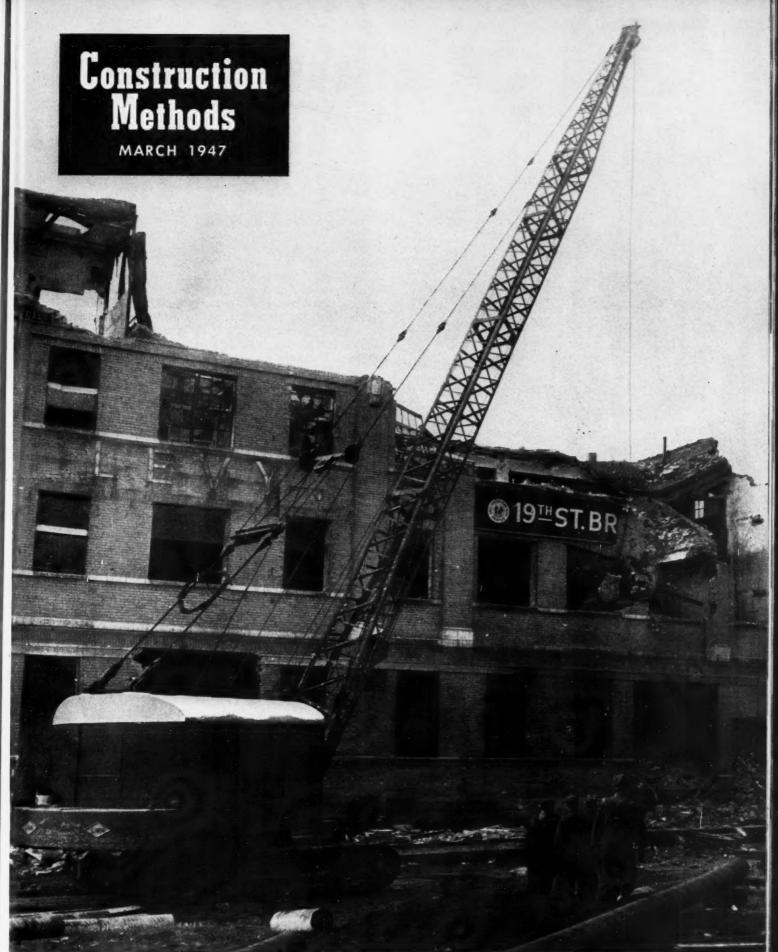
HARD ROCK LUG for super stamina in all rock work ALL-WEATHER EARTH MOVER for drawn vehicles and general traction

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Sure-Grip, All-Weather-T.M.'s The Goodyear Tire & Rubber Company

GOODFYEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND



Mai Gurian Photo

DESTRUCTION METHODS

SWINGING at the end of a Lima crane boom, a $1\frac{1}{2}$ -ton pear-shaped steel ball smashes into the walls of the 3-story Dairylea building in New York City to make way for the Stuyvesant housing project. Wreckers

& Excavators, Inc., subcontractors on building demolishing on the project, find the heavy ball method the simplest and most effective way to wreck brick structures. Starrett Bros. & Eken are general contractors.

Step by Field Methods

GUY DERRICK towering over adjacent structures erects steel for 33-story Esso Building in New York City. With 100-ft. mast, 90-ft. boom and 16-ton capacity at 75-ft. radius, rig sets columns of next two stories after 25-ft. jump from previous set-up two floors below. Derrick boom weighs 5 tons; mast, fittings and guys, 7 tons.

HOW TO JUMP A GUY DERRICK

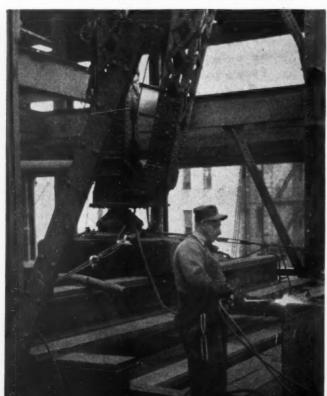
SKYSCRAPER CONSTRUCTION is again under way in Manhattan and the old dependable guy derrick is back at work erecting high steel. Where buildings are too tall for crawler cranes, no more efficient rig has been devised than the guy derrick, basically unchanged since the switch from timber to steel for mast and boom some 40 years ago. Literally lifting itself by its bootstraps to jump up two floors at a time as structural steel is erected, the guy derrick is a simple, safe rig that goes up and up along with the building frame.

Mast and Boom Act as Gin Poles

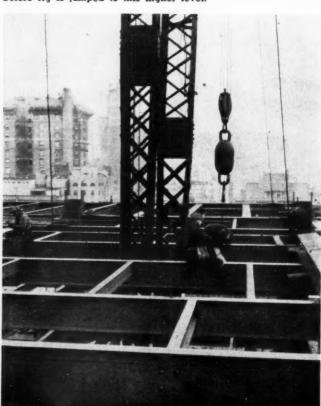
Shown step-by-step in accompanying photographs is the derrick jumping procedure followed by Bethlehem Steel Co. on the erection of the 33-story Esso Building in New York City. The 100-ft. mast and 90-ft. boom of the 16-ton capacity rig each acts in turn as a gin pole; the mast to step out the boom, the boom to raise the mast two floors and the mast to lift the boom to the derrick's new level. No rerigging of lines is necessary. The normal topping-lift from masthead lifts the boom, the load line raises the mast. Although derrick jumping is no easy procedure, only one hour elapses between knocking-out of boom pin and refastening of boom to mast at the higher level. After working platforms and planking

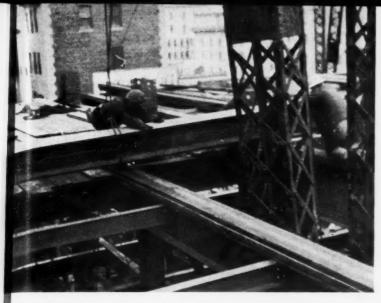
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BEFORE JUMPING, derrick (below) sits on temporary beam grillage resting on building frame and erects steel of two higher stories. Wire rope kickers hold foot-block in place.



2 DERRICK IN CLOSE QUARTERS (below) booms up tight to set last of steel in floor two stories above derrick base before rig is jumped to this higher level.





3 TEMPORARY GRILLAGE is set to support derrick on upper level. These are still called foot-block timbers despite fact that they are 14-in., 147-lb. steel beams.

are set, the rig is back at work erecting steel less than 4 hr. after it placed the last of the floor to which it was jumped.

General contractor for the Esso Building, 15th of Rockefeller Center's huge structures and one of New York's first post-war sky-scrapers, is John W. Harris Associates, Inc., New York. Steel is supplied and erected by Bethlehem Steel Co., with George Kloven in charge. Carson & Lundin are architects for the tall structure, with Wallace K. Harrison as consultant. Edwards & Hjorth are structural engineers.

BOOM IS UN-4 PINNED from mast and is fastened to steel shoe when mast, as ginlifts through normal topping-lift or boom falls. After being stepped out, boom is turned 180 deg. to bring load line next to mast. Bent corners of 14-in. sq. shoe plate spike it to temporary timber

base. Note foot-block kickers unhitched from building frame, and block temporarily fastened to mast to insure its being lifted when mast goes up.

5 WITH BOOM STEPPED OUT (below), five jumping guys from boom tip are set up so boom can function as gin pole. Two guys brace boom on mast side; three are splayed back.

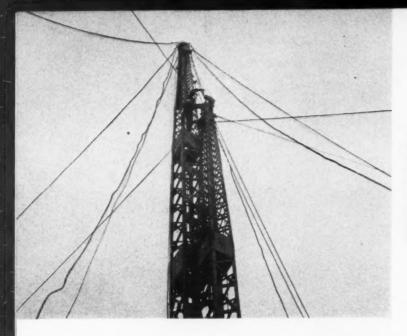


6 LOAD FALL from guyed and stepped-out boom is hooked to choker around mast 30 ft. below boom tip to give plenty of drift for making 25-ft., two-floor jump.

Continued on Next Page

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CONSTRUCTION
METHODS



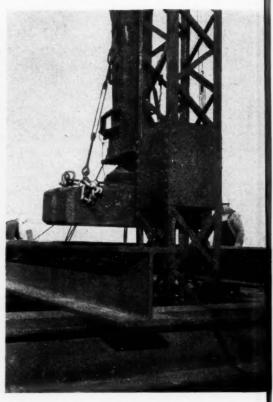


7 BOOM GIN
POLE lifts mast
after eight 1-in. wire
rope guys radiating
from mast-head
spider are unhooked
from building frame.
Note reversed position of topping lift.









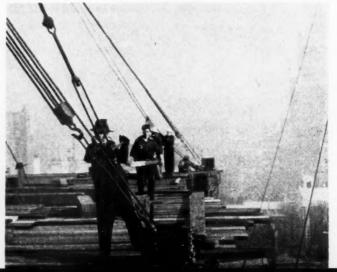
UP GOES MAST. Lifting line is normal load line running from 2-drum electric hoisting engine below, passing through mast foot-block sheaves to boom tip, then down to choker on mast.

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JUMPED MAST (below) is rested on temporary grillage after beams are skidded into place. Planking eliminates steel-to-steel contact; prevents foot block kicking out under load.

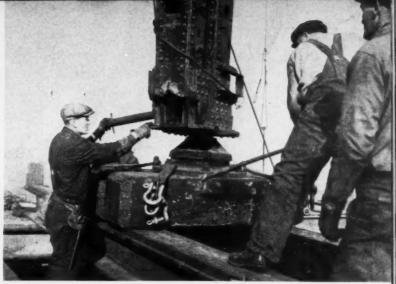
10 DERRICK GUYS (below) are re-fastened and turnbuckles tightened after mast is raised. Block and falls are part of jumping guys.



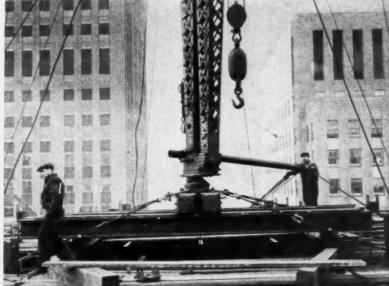




WITH MAST RE-GUYED, jumping guys and load falls are unhooked, and boom is hoisted by topping lift from mast gin pole. Shoe is still pinned to boom heel.



12 BOOM IS RE-PINNED to mast after shoe is removed. This is ticklish job because double taper on boom and mast tends to kick heel of boom away from mast as topping lift takes strain. Choker from load falls pulls members together. Only one hour has elapsed since pin was knocked out when derrick was two floors below.



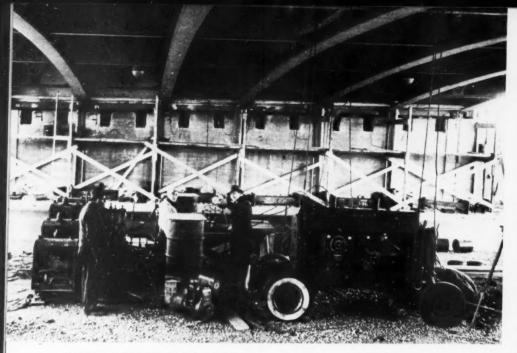
13 JUMPING IS COMPLETED by fastening foot-block kickers, and derrick goes back to work raising steel 4 hr. after it finished floor on which it now rests. Rig with ball bearing base and mast-head fittings is turned manually by bull-stick man aided by block and falls.

WELDING RATHER THAN BRAZING

joins red brass condensate returns of central heating system supplying nearby hospitals with steam from mains of University of Pittsburgh's Cathedral of Learning. Since coalescence is obtained at temperature above melting points of base metal and welding rod, joint is true weld as distinguished from "bronze weld" which is more usually brazing. Incased in 15-in. Ric-wil insulated conduit, 5-in. and 2-in. lines 3,000 ft. long are oxyacety-lene welded with Chase type B Olympic bronze rod to withstand 125-lb. test. Two 10-in. steel pipes in 18-in. conduits (rear) are 250-lb. steam supply lines and will also be welded. Dravo Corp., Pittsburgh, is contractor for job.

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POCKETS CUT IN ABUTMENT hold hydraulic jacks for raising 700-ton bridge over low section of divided parkway. Heavy 90-ft. span is lifted 5 ft. in two days.

Heavy Span Raised 5 It. in Two Days

By WELDON S. BOOTH

Engineer, Spencer, White & Prentis, Inc. New York, N. Y.

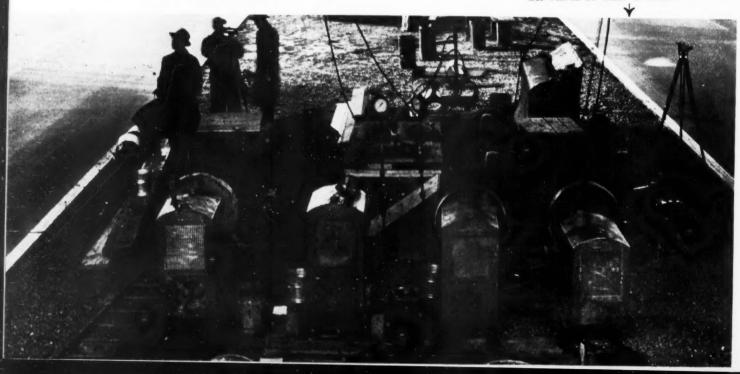
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BEFORE RAISING THE GRADE of a stretch of New York City's Shore Parkway, Brooklyn, to remove a drainage pocket where water from rain and high tides often collected to form a serious traffic hazard, it was necessary to lift 63 in, an overpass bridge spanning the road. Subcontractor for the bridge raising, Spencer, White & Prentis, Inc., New York, lifted the 700-ton structure with 28 hydraulic jacks carefully controlled by master and individual valves. By jacking directly from the abutments, traffic flow beneath the span over the heavily traveled route was uninterrupted.

The bridge, decked with an 11in, concrete slab, was a 90-ft, span of seven plate girders on 9-ft. centers supported by concrete abutments on precast concrete piles. At the bridge seats, cross-bracing between girders was incased in 18in. concrete curtain walls resting on the horizontal webs of 18-in. I-beams that formed the lower lateral braces.

It was originally planned to raise the bridge by jacking between a temporary beam welded to the underside of the girders and rigid falsework erected below for jacking reaction. However, the bridge-raising contractor devised a simpler scheme of jacking from existing abutments that: Maintained load on foundation piles during the lift, (2) permitted jacking in the plane of bridge bearings so that no eccentric loads were thrown on the abutments,

FOUR DUPLEX PUMPS on highway median strip supply 28 hydraulic jacks. lacks on each abutment are fed through manifold by single line from master control valves on table in center.





INDIVIDUAL JACK VALVES are controlled by workmen on scaffold. Entire bank of 14 jacks on each abutment may be controlled at central master valve.

(3) eliminated costly falsework, (4) kept differential girder movement to a minimum by utilizing the rigid jacking reaction of the abutment and using the beam beneath the reinforced concrete curtain wall as a jacking point, (5) did not impede traffic beneath the bridge.

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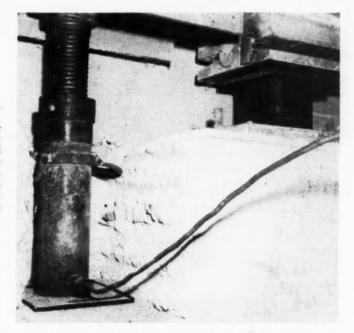
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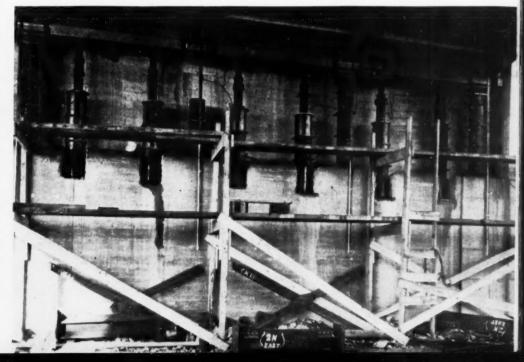
Twenty-four 12x21x24-in. wedge-shaped pockets were cut into abutments 21/2 ft. on either side of girders, and 40-ton hydraulic jacks set under the centerline of the 18-in. curtain wall. Jacks were placed on 3/4-in. bearing plates leveled and drypacked in the pockets. At the edge girders, two 40-ton jacks were set in one pocket, and 50-ton jacks were placed in the second pockets on one side where a sidewalk slab caused unequal loading. A special screw collar on the 40-ton units prevented the piston from retracting should jack, line or pump fail.

Four duplex pumps were placed on the parkway median strip beneath the span and hydraulic lines were suspended from bridge girders. Two pumps piped together supplied each abutment through a master control valve and 1/2-in. hydraulic line, and all jacks on one abutment tied into a manifold connected to this single feed. Although there was a valve at each jack, lifting was ordinarily controlled by master valves at the pumps to insure split-second control. Jacks had an effective 8-in. rise, and a total of nine lifts was required. For blocking beneath

BEARING ROCK-ERS are tied together by welded straps during bridge raising operations. Hydraulic jack, left, rests on steel plate drypacked in to abutment pocket.



GAGES suspended from each end of each girder are read by level to detect any differential movement. Span is at new elevation, ready for installation of columns and cross-bracing shown on ground.



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GIRDERS AND JACKS are blocked with steel cylinders as bridge rises in 8-in. lifts. Note jacking plates welded to under side of beams that support curtain wall and brace girders.

jacks, and as temporary support beneath bearings while jacks were prepared for the next lift, 10¾-in. and 12¾-in. seamless steel tubing was used, cut in 7-, 15-, and 23-in. lengths with ends milled square. Two or more cylinders were placed, with 7/8-in. bearing plates

Page 84 — CONSTRUCTION METHODS March 1947 between lengths, for heights in excess of 23 in.

Operating 28 jacks simultaneously required exact control to prevent cracking the bridge deck by differential movement. Two levels were set up to read this movement and, on signals from the levelmen, individual jack valves were regulated as required or the whole system shut down at the master controls. The bridge was raised an average of 8 in. in 20 min., and a one-lift cycle of jacking, blocking, and re-setting jacks took about 50 min. With the bridge lifted a total of 66 in., permanent steel columns were set over existing anchor bolts and the span lowered 3 in, to bear on base plates atop the columns. Bracing was installed between columns, and fixed bearing plates were welded to complete the raising operation two days after jacking started. Final examination disclosed no cracks, failures or disfiguring marks.

For the New York City Department of Parks, Hardesty & Hanover, New York, were consulting engineers, represented on the job by Kenneth B. Wolfskill and Herbert Goodkind. General contractor was Melwood Construction Co., New York, for whom J. Mas-

WITH COLUMNS AND BRACES set between girders and abutment, burner cuts rocker straps to complete bridge raising. New supports will be incased in concrete.



SPECIAL SCREW COLLAR on threaded ram of hydraulic jack prevents piston retracting should jack, line or pumps fail. Collar, shown here in raised position, is kept against shoulder of jack during lift.

sela was superintendent. The bridge was raised by Spencer, White & Prentis, Inc., under the direction of Joseph C. Weaver, general superintendent, with M. Canale, job superintendent, assisted by G. F. Flay, Jr. and the writer





THE GODS OF CONSTRUCTION smile down upon Charles H. Locher in retirement on his Virginia farm after a fruitful career in construction, for they see a man who has done well. Everyone who knows him feels an inner glow when thinking of him, for to know him is to love him, to work with him is a stimulating experience. Charles Locher is more than a grand old man of construction, he is a great man among men. He is one of that fast-dwindling clan of rugged individualists who made America great through construction during the last 65 years.

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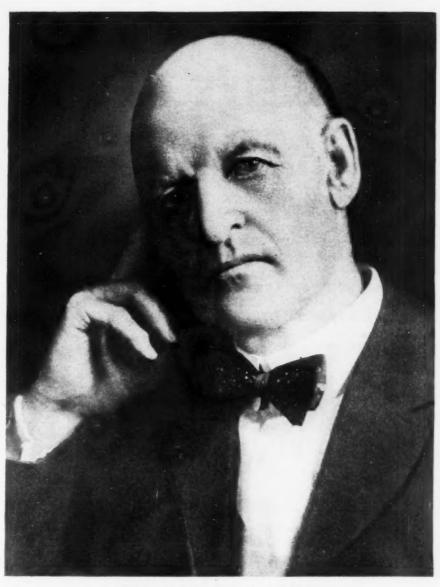
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Locher was born in Glasgow. Va., Oct. 2, 1862. When only 16 years old he left grammar school to follow railroad building in the mid-south. In 1887 he became a partner of the outstanding contracting firm of that time, C. R. Mason & Co. For the next 30 years he was associated with many contractors prominent in construction history such as Rinehart, Clark, Hanger, Mitchell, Harder, Williamson, Winston & Co., MacArthur Bros., and Grant Smith & Co.

During this period he built some of the country's greatest projects, including many railroad lines. The list includes the Chicago Drainage Canal, the Wachusset Dam and Weston Aqueduct for Boston's water supply, part of the C. & O. and Western Maryland railroads, West Neebish Channel of St. Mary's River, the troublesome Livingston Channel in the Detroit River, Shoshone Dam, Mississippi levees, the New York State Barge Canal, big hydro plants, the Catskill Aqueduct, and part of Keokuk Dam—all taken in stride by Locher and his associates.



CHARLES H. LOCHER

In 1917 he left contracting to direct the force-account construction of the Miami Conservancy District in Ohio, the largest flood control project ever attempted up to that time. Upon completion of this job in 1922, Locher laid off construction work for a few years, but was busy as a consultant.

By late 1925 he was back in construction in a big way with the late Frederick Cranford on two difficult sections of the Eighth Ave. subway in New York, both completed ahead of schedule. He then took a couple of years off to tour Europe.

In 1933 he was again called upon as a consultant in the planting and planning of the first Tennessee Valley Authority projects. As a result of this experience, he collaborated with A. J. Ackerman in writing a series of articles for Construction Methods on "Construction Plant and Planning," later published in book form.

His advice and counsel in construction problems has been sought by both his contemporaries and the younger generation. He never turned anyone away that was seeking help. His inherent common sense and judgment, enhanced by a richness of experience, together with a sterling character and sense of justice, leave him with few equals in arriving at correct conclusions.

The genuine warmth and friendliness of Charles H. Locher knows no bounds. As a builder, his greatest structure is his own career.

MORRISON AND CRIMMINS RECEIVE MOLES' AWARDS

Governors of New York and Idaho Laud Winners



Proctor Presides
at Ceremony



Admiral Moreell and
J. Rich Steers Present
Citations to Winners

SEVEN HUNDRED PROMINENT CONSTRUCTION MEN, in person, and the Governors of two states, by telegram, paid tribute at the Roosevelt Hotel, New York, Feb. 5, to this year's two winners of the annual Awards "for outstanding construction achievement." presented by The Moles, society of tunnel and heavy construction men, to Thomas Crimmins, Mole member and president of the century-old Thomas Crimmins Contracting Co., New York, and to Harry W. Morrison, non-member, president of Morrison-Knudsen Co. Inc., Boise, Idaho, and participant in the building of Boulder Dam and other notable engineering structures. The award ceremonies, opened by Alfred N. Warwick, Mole president, were presided over by Carlton S. Proctor, consulting engineer and chairman of the society's Award Committee. Presentations of citations and bronze plaques were made to Col. Crimmins by J. Rich Steers, New York contractor and Mole vice-president, and to Mr. Morrison by Admiral Ben Moreell former chief of the Navy's Bureau of



FOR OUTSTANDING CONSTRUCTION ACHIEVEMENT, HARRY W. MORRISON (left) president, Morrison-Knudsen Co., of Boise, Idaho, and THOMAS CRIMMINS (right) New York contractor receive annual Awards to a non-member and to a member of The Moles, society of tunnel and heavy construction men. Presentation is made at dinner ceremony in New York City, Feb. 5 by CARLTON S. PROCTOR, New York consulting engineer and chairman of Moles Award Committee.

Yards and Docks and recently named president of the Turner Construction Co., New York.

In a telegram to Chairman Proctor, Governor Thomas E. Dewey, of the State of New York, said:

"Won't you please convey my heartiest congratulations, both personally and as governor, to Mr. Thomas Crimmins on his receiving the highest award conferred by the construction industry. The completion of 99 years of distinguished service in the field of construction in New York is a magnificent record which I am delighted to hear is recognized by The Moles' Award of 1947 to the third in that line of fine builders."

From Governor C. A. Robins of the State of Idaho, Mole President Warwick received this telegraphic message:

"Please extend to Mr. Harry W. Morrison my personal congratulations and the congratulations of

hundreds of his fellow citizens throughout the State of Idaho on the occasion of your presentation to him of The Moles 1947 nonmember Award for outstanding achievement in the construction industry. We are pleased and honored that an organization comprising individuals of high personal attainment should give expression to the same regard which we, the citizens of Idaho, hold for Mr. Morrison. We honor him as a peerless builder of engineering works, we honor him no less for his constructive and unselfish efforts in the civic and economic development of our great state."

Sound Labor Relations Needed— Throughout the addresses of the Award winners and their sponsors was sounded this basic note: the necessity for effective labor-management relations if the construction industry is to capitalize to the fullest extent on the great opportunity that the future offers. In opening the award ceremonies Col. Proctor said, in part:

"The importance of this occasion has grown so steadily that The Moles Award has become one of the most significant recognitions of real achievement in the engineering-construction industry. In our meeting here tonight are many of the men who worked miracles in wartime construction, men who set the pattern for coordinated effort with our armed forces and fused the construction industry into an integrated unit. We now look to them to oppose vigorously a return of this industry to its prewar, uncoordinated intra-competitive status.

"Our industry's long record of working cooperation with labor, vital to successful contracting, has taught us that an industry-wide labor-management partnership is essential to a continued free enterprise system. Of course, by 'partnership' is meant an honest effort by labor to assume maximum production, efficiency and economy and an equally honest attitude by management to assure a continued high living standard and labor's share in the rewards of a prosperous, full production. We have here tonight, among our guests and the organizations that many of them represent, and in our own membership, the very leadership

that the nation so sorely needs. We should organize that leadership to influence national policy and, particularly, labor-management legislation.

"From the least to the most important man in design or construction, we succeed in direct proportion to our ability to work as a team with labor. And from that teamwork we have learned that American labor is fundamentally America. Labor leadership must of course be purged of its communism and other alien ideologies and the flagrant abuses encouraged by the Wagner Act must be quickly corrected. But in these necessary cor-

(Continued on page 170)

AMONG THOSE PRESENT AT MOLES' AWARD DINNER



CHARLES E. TROUT, Great Lakes Dredge & Dock Co.; RAY N. SPOONER, Allen N. Spooner & Son; HOWARD KING, Mason & Hanger Co.



CHARLES H. SELLS, superintendent, N. Y. State Dept. of Public Works: GEORGE L. YOUMANS, Morrison-Knudsen Co.; THOMAS J. WALSH, Walsh Construction Co.



J. RICH STEERS, Jr., J. Rich Steers, Inc.; THOMAS CRIMMINS, Thomas Crimmins Contracting Co.; CARLTON S. PROCTOR, Moran, Proctor, Freeman & Mueser: CHARLES B. SPENCER, Spencer White & Prentis, Inc.; ALEX STAGG, A. M. Stagg Lumber Co.

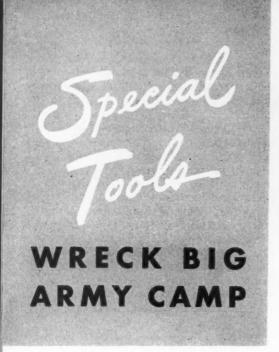
(Below) M. G. KENNEDY, Morrison-Knudsen Co.; R. C. WILSON, Turner Construction Co.; L. S. COREY, Utah Construction Co.; ADMIRAL BEN MOREELL, Turner Construction Co.; H. W. MORRISON, non-member Mole Award winner; ALFRED N. WARWICK, president of The Moles.

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(Below) COL. W. N. CAREY, secretary, American Society of Civil Engineers; O. W. SWENSON, Foley Bros. and 1946 Award winner; LUTHER S. OAKES, Winston Bros. Co.









BUILDING IS DISASSEMBLED at Camp Howze, Tex., surplus Army camp demolished to furnish salvaged materials for housing program. Majority of 2,500 structures dismantled are similar to barracks shown here.

By COL. C. H. CHORPENING

U. S. District Engineer, Tulsa, Okla.



SCUFFLE HOES rip tar paper from barracks roof. Blade on end of long handle strips nails along with paper, lessening clean-up of salvaged lumber.

DISMANTLING 2,500 BUILDINGS on a 6-month completion-date contract is no small job, but when one month is shaved from the schedule and 95 percent of the salvageable material is recovered it means fast, careful work by the demolition contractor. To establish this record on the demolition of Camp Howze, Texas, United Construction Co., of Dallas, carefully trained their workmen and organized them into efficient crews, devised special tools to speed material removal yet lessen damage to it, and instituted safety measures that held lost-time accidents to only 15 in 780,000 man-hours of work.

Demolished buildings in the 1,800-acre cantonment area ranged up to 1,000-man capacity theaters but the majority were single-story, 20x100-ft. barracks with 1-in. wood sheathing covered with tar paper. Roofs had ½-in. insulating board between sheathing and paper, while floors were wood on concrete piers. To minimize damage to material during removal, the contractor developed his own tools as supplements to the standard wrecking bar and claw hammer. In addition to those shown in accompanying photographs, special devices included a bar with flat notched tip for removing nails from asphalt roofing and a similar tool with a sharpened chisel point to cut nail heads from asbestos shingles.

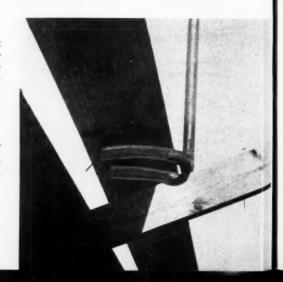
At the peak of operations the contractor's field



MORTAR HOE with straightened shank removes insulation board from roof. Special tools devised by contractor speed job and increase yield of salvageable material.

FORKED BAR of 1-in. round steel pries tongue-and-groove sheathing from rafters. Tines are 8 in. long, $4\frac{1}{2}$ in. apart.

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SLOTTED HEAD on wooden tool slips over flooring or sheathing to pry it loose with minimum damage to tongue-and-grooves.

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TRUSSED RAFTERS hang inverted after ends are pried loose from wall plates. Temporary braces on 16- to 20-ft. centers hold sidewalls.

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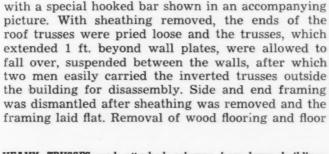
force was about 1,400 men. A shortage of construction workers made it necessary for most of this force to be given thorough training, and during the training period speed was subordinated to care in removing material without damage. Main demolition gangs of a foreman and 14 laborers dismantled buildings from start to finish after carpenters had taken out all millwork and subcontractors' crews had removed mechanical and electrical fixtures. Experiments with demolition gangs organized with carpenters and laborers mixed proved that although greater speed and more salvaged materials were obtained, the resultant savings were not sufficient to offset the increase in wages over those of the all-labor crew.

Dismantling and Salvage Procedure

Salvage of mechanical fixtures was handled in four stages—removal, hauling, breakdown and cleaning, and warehousing—with specialty crews on each operation. The materials, largely heating and plumbing installations, were removed in large sections and trucked to warehouses where breakdown was completed on a disassembly line basis. Heavy items were cleaned on the hauling trucks to avoid rehandling. Demolition of electrical fixtures and equipment proceeded in a like manner.

After millwork and mechanical and electrical installations were removed, demolition crews stripped lath battens and tar paper from the structure and removed roof insulation board. Roof sheathing at the ridge and near the eaves was butted loose from inside the building and the remainder was pried off

SEVERAL WIDTHS of flooring are pried loose at once by forked device similar to that used on sheathing. Horse-shoe-shaped base is welded to 4-ft.



HEAVY TRUSSES and attached columns from large buildings (below) are removed by 1-yd. Marion crane with 10-ft. jib on 40-ft. boom.







MECHANICAL INSTALLATIONS from wrecked buildings are broken down into original component parts on disassembly line in warehouse.



SPECIAL WRECKING BARS remove finish flooring. Sharp flat point on goose-neck shank is forced under boards to pry them loose with little damage.



NAIL TABLE for cleaning lumber is set up alongside building demolition. Extracted nails fall in trough, keeping area free of puncture hazards. Safety measures such as this cut accident insurance cost 50 percent below estimate.

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FARM-TYPE TRAILER (below) drawn by weapons carrier hauls salvaged lumber to stockpile. After boards are sorted and stacked, extending damaged ends are cut off with portable electric hand saw.

joists and sills from the concrete piers completed barrack dismantling operations.

Other type buildings were demolished in a similar manner. On those with gypsum board siding, the holding nails were driven completely through the material with drift punches to avoid breakage and leave only nail-head holes in the board. Flexible crews of carpenters and laborers dismantled large structures, working from scaffolding, and crawler cranes removed heavy roof trusses and attached columns intact. Brick stacks were demolished by dynamiting at the base after building removal.

All salvaged material was warehoused or centrally stockpiled and inventoried by the contractor. A fleet of 72 pneumatic-tired farm-type trailers, with six Army weapons carriers as hauling units, moved salvaged items, including an estimated 22,000 M b.-ft. of lumber, to storage. Trailers were spotted at building sites and salvage was loaded on them during demolition to minimize handling.

Lumber recovery averaged 95 percent of that considered salvageable (4-ft. lengths and over), and 85 percent of the total quantity in the original buildings. Excluding mechanical trades, man-hours expended

SALVAGED WIRE is reeled as it is removed from buildings. On lengths too short for re-use, insulation is burned off and copper recovered.





in dismantling a barracks dropped from 280 at the beginning of the project to an over-all average of 153, of which 90 percent was common labor. This included removal and salvage of 3,300 sq. ft. of insulation and recovery and cleaning of 8,700 b. ft. of lumber, 6 doors and 24 windows per barracks. During peak operations, 40 units were dismantled each day. General contractor for the estimated \$2,500,000

demolition job at Camp Howze was United Construction Co., Dallas, Texas, with Ralph Daniels as project manager. Mechanical and electrical phases of the work were sublet to the Farwell Co. and Rob Roy Electrical Co., respectively, both of Dallas. The project was supervised by the U. S. Engineer office, Tulsa, Okla., for whom the author is district engineer and Lee R. Crist is resident.

Navy Acquires Huge German Floating Crane

THE CIVIL ENGINEER CORPS of the Navy has brought to the U. S. for use on the Pacific Coast what is believed to be the largest self-propelled floating crane ever built. One of four identical cranes constructed by Germany early in the war, this unit can lift 350 tons at 114-ft. radius. Valued at approximately \$3,000,000, the crane will require an expenditure of only about \$100,000 for the Navy to put it in service.

The huge rig is a jib-type level-luffing crane displacing 5,000 tons, with an over-all height of 375 ft. at high boom. The pontoon, which is rectangular for maximum stability, is 205 ft. long, 108 ft. wide and 17 ft. deep. Because of its extreme width, the pontoon's bumpers had to be removed to enable it to pass through the Panama Canal.

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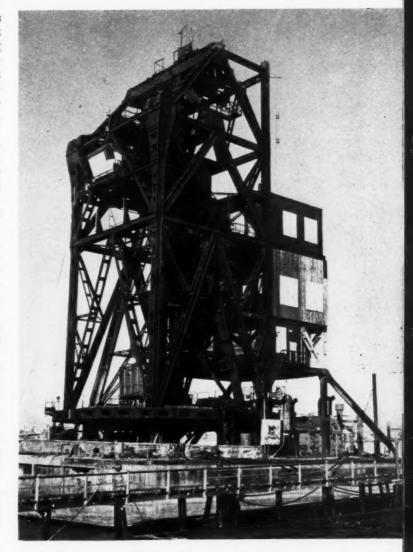
The crane hull is equipped with three propellers, one in the bow and two astern. Power for the propulsion units, as well as for crane operating mechanism, is supplied by three diesel generators, totaling 2,400 kva. in capacity. An auxiliary 275-b.h.p. diesel drives a 225-kva. generator for lighting, heating and auxiliary machinery, and a diesel-driven 14-kva. emergency generator powers compressors and winches.

Overhanging the crane frame at the back is a three-story machinery house, in the lower section of which is located a 400-ton concrete counterweight. An additional 200-ton movable counterweight is provided in the jib arm of the crane.

The jibs are divided into pairs of symmetrical trusses. The junction of the rotary and fixed elements resembles that of a rotary bell placed over a fixed pyramidal base structure.

Suspended on ten-part lines are two 175-ton hooks and two 30-ton hooks, each pair of which may be operated singly or coupled for double loads. The 30-ton hooks and a 10-ton hook which is an additional feature of the crane are operated by trolleys that permit quicker movement of small loads and more accurate spotting.

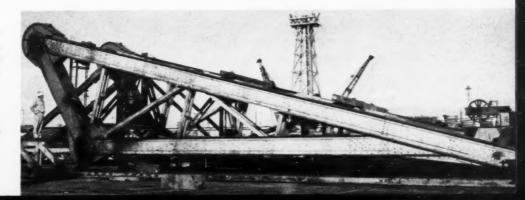
The crane is controlled from a central cab located just below the boom pin, 100 ft. above the water line.



OVERALL HEIGHT OF 375 FT. at high boom and lifting capacity of 350 tons are features of German floating crane here shown being readied by U. S. Navy at San Pedro, Calif., for Pacific Coast use.

U. S. Navy Photos

HUGE BOOM is being prepared for attachment to base section of floating crane shown in another illustration herewith.

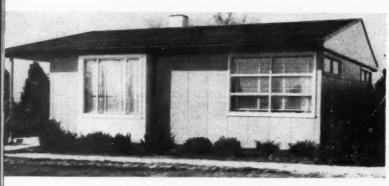


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ROCKEFELLER CENTER moves uptown, with construction of 33story Esso Building opposite north end of Rockefeller Plaza between 51st and 52nd streets in New York City. Contractors for structure are John W. Harris Associates, Inc. Wide World Photo

THIS MONTH'S REWS EREL



STRUCTURAL STEEL replaces lumber for sills, studding and rafters of 32x36-ft. pre-built five-room house, manufactured by Lustron Corp., Chicago. Cost, including lot, is about \$7,000. Interior and exterior finish and shingles for roof are made of non-glossy porcelain-enameled steel sections. Company plans production of 400 houses a day.

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AMPHIBIAN ENGI-NEER ASSOCIA-TION has been organized at Washington to foster science of amphibian operations. MAJ. GEN. DANIEL M. NOCE (right), recently appointed chief of Civil Affairs Division, office of the Chief of Staff, War Department, is national beachmaster, or president, of new society. He is congratulated by BRIG. GEN. AR-THUR G. TRU-DEAU, chief of War Manpower Board. who was chosen shore commander.



THREE HUNDRED PACKAGE HOUSES (below), part of \$5,000,000 mass production project backed by Henry J. Kaiser and Fritz B.

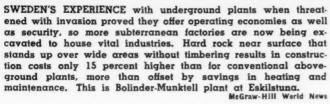
Burns, land developer, are under construction in southwest Los Angeles. They hope to build 10,000 more dwellings in 1947.

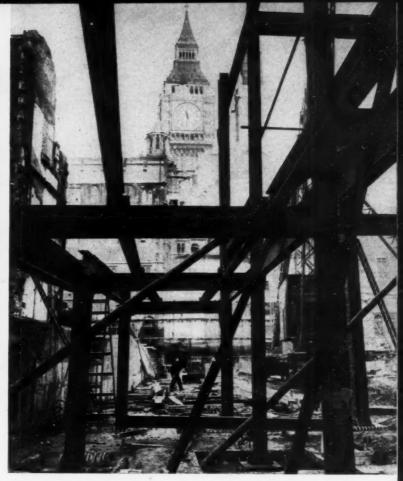
Wide World Photo





for





NEW HOUSE OF COMMONS rises in London on foundations of old building destroyed by German bomb in 1940. Gothic structure, for which steel erection is now under way, will take years to build.

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LARGEST VESSEL built on inland rivers of United States is huge floating drydock (below) for Navy as it appeared last year when sliding into Ohio River from launching ways of Dravo Corp., Neville Island, Pittsburgh, Pa. Welded steel vessel, with 6.000-ton lifting capacity, is 448 ft. long and 97 ft. wide and has wing walls 45 ft. high. More than 73 mi. of welding went into its construction. At launching ceremony Mrs. Ben Moreell, wife of former chief of Navy Bureau of Yards and Docks, served as sponsor.





NEW LOADER heaps 15-cu, yd. dump wagon in less than one minute in grading Shirley Memorial Highway extension in Virginia. High-speed Euclid loader drawn by Caterpillar D8 is assisted by pusher wagon for uphill digging.

ELEVATING LOADER

Moves Million Yards on Virginia Superhighway

All Photos from Public Roads Administration

THE NEW ELEVATING GRADER TYPE of loader recently developed by the Euclid Road Machinery Co. got a real workout on Nello L.

Shirley Memorial Superhighway in Virginia, southwest of Washington. At times moving up to 800 yd. per hr., the loader handled much Teer's contract for extending the of the 1,200,000 cu. yd. of grading

on the project. The machine heaped 15-yd. dump wagons at the rate of one per minute.

The Euclid loader is essentially a tractor-drawn mold-board type

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BOTTOM-DUMP WAGON (below) maneuvers under overhanging conveyor boom of Euclid loader digging 800 cu. yd. per hr. in wide cut. Diagonal boom is shipped over machine body for road travel.





AUXILIARY EQUIPMENT used with Euclid loader includes ripper to loosen hard material and Caterpillar No. 12 diesel patrol grader to slope banks, maintain haul road used by high-speed Euclid dump wagons, and for clean-up.

plow that forces earth to a highspeed belt conveying the excavated material to accompanying dump wagons. At the front of the machine is an inclined cutting blade that scoops up material on to the conveyor belt as the grader is pulled along by a crawler-type tractor. The left end of the cutting blade is fitted with a plow point that cuts and boils material to the belt's charging throat, while a deflecting wing at the right end of the blade also funnels earth to the belt. The conveyor is mounted diagonally to permit loading from

the left and discharging to the right rear.

The loader frame is mounted on a pair of crawlers at the rear, and the front is supported by a heavy yoke connected to the pulling tractor through a universal hitch. A hydraulic ram mounted on the yoke controls the digging depth by raising or lowering the cutting blade, while another ram on the crawler truck regulates the transverse tilt of the loader. A 150-hp. Cummins diesel engine mounted in the loader frame powers the conveyor belt as well as a pump

that supplies both regulating rams. The tractor operator controls the loader through three levers governing the rams and the belt.

Although the machine is capable of digging to a width of 9 ft. and a 2-ft. depth, the contractor found that the optimum cut in the light, clayey gravel encountered in the Shirley extension was 36x18 in. Making a cut of this size, and pulled by a Caterpillar D8, the loader fed a 12-unit fleet of 15-cu. yd. Euclid bottom-dump wagons with a continuous flow of earth. Working with the Euclid

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PLOW POINT on near side of loader (below) makes 36x18-in. cut, and boils earth into charging throat where high-speed belt carries it to accompanying wagon. Pulling-tractor operator controls loader through three levers governing conveyor belt, cutting depth, and grader tilt. Belt is 54 in. wide.





PARALLEL TRAVEL of loader and wagon requires minimum cut width of 30 ft. Cummins 150-hp. diesel engine powers conveyor belt as well as hydraulic pump for regulating rams on loader yoke and crawler truck.

loader and high-speed wagons were a ripper patrol grader, two bulldozers, and a sheepsfoot roller. The ripper preceded the grader to loosen hard material, while the patrol grader sloped banks and maintained haul roads, often a mile long, for the wagons. The bulldozers spread dumped material in 8-in. layers for compaction by the roller. For short hauls, and for cuts with small yardage, the contractor graded with four 12cu. yd. LeTourneau carryingscrapers. Three bulldozers cleared in advance of all grading.

The 15-mi. extension to Virginia's Shirley Memorial Highway is

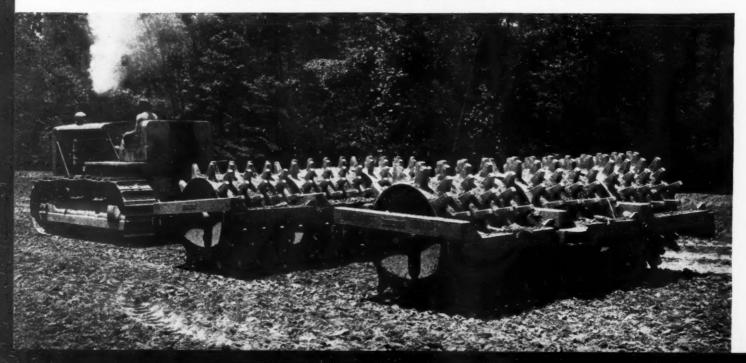
being built as a federal-aid project to carry traffic from the present road terminus at the Fairfax County line to a junction with U. S. Route 1 near Occoquan Creek. The completed roadway will have two 10-in. thick reinforced concrete pavements 24 ft. wide separated by a grassed median strip varying from 14 to 70 ft. in width. It will be a limited access route with no crossings at grade. Minimum width of the right-of-way is 300 ft.

The Nello L. Teer Co., of Durham, N. C., for whom W. R. Burton is superintendent, held the grading and drainage contract for the 6.8-mi. section of the extension

where the equipment and methods described were used. Major item in the \$496,912 contract was 1,-176,000 cu. yd. of earth excavation at a bid price of 28½c. per yd. Cuts averaged 18 ft. in depth, the largest single cut, which contained 220,000 cu. yd., being 100 ft. deep. For the Public Roads Administration, Virginia District Office, G. W. Hoffman is highway engineer and M. B. Kinniken is district engineer. J. H. Phillips and E. F. Prede are resident and project engineers respectively for the Virginia State Highway Department of which C. S. Mullen is chief en-

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TWO-GANG SHEEPSFOOT (below) rolls 6- to 8-in. layers of light, clayey gravel (PRA class A1 to A3) for subgrade of Shirley Memorial Highway. Heavy rubber-tired hauling equipment operating over fills helps to reach specified 95 percent compaction.



Ratchet Hoists Level Tilted Bridge Floor

RATCHET LEVER HOISTS played a major role in restoring to service, at low cost, a highway bridge roadway over Coal Creek, Fountain County, Indiana, which had tilted steeply after one end of a concrete pier supporting the structure had settled 30 in. to a solid bearing, following a flood. After consultation with two bridge contractors, it was deemed impractical to raise the bridge by the screw-jack method of cribbing up from underneath because of the constant danger of freshets washing away the cribbing and allowing the bridge to topple.

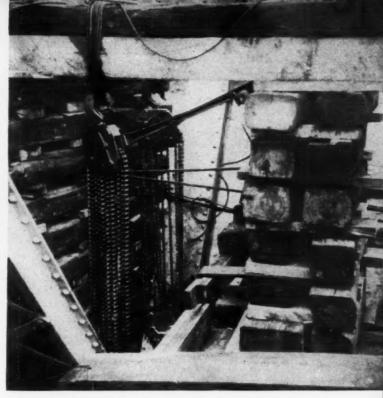
Under normal conditions the pier stands in 6 ft. of water. It was estimated that to remove the bridge and replace the pier would cost the county \$40,000. However, two residents of the county, Homer and

J. D. Coffing, brothers of F. W. Coffing, manufacturer of safety-pull ratchet lever hoists, conceived a method of doing the job with the aid of two 15-ton and two 6-ton capacity Coffing hoists. This method consisted of placing cribbing on top of the tilted pier instead of underneath the bridge. Enough of the flooring was removed to allow cribbing up 7½ ft. on both the inside and outside of the lower chord members of the bridge truss, as illustrated.

Hoists Lift Truss Ends

Two 15-ton safety-pull hoists were next suspended from beams across the cribbing and attached to the ends of the 125-ft. truss spans. The hoists were then operated simultaneously, thus keeping the entire bridge structure in balance at all times while raising the spans. The two 6-ton hoists were attached to shore anchors 200 ft. from the bridge, with cables running to the top of the bridge to pull the top of the structure back into alignment while the bridge was being raised with the 15-ton hoists.

After the bridge spans had been raised 31 in., two 16 in. steel I-beams 5 ft. long were placed side by side across the pier where



RAISING OF BRIDGE SPANS is done by two 15-ton capacity Coffing ratchet lever hoists suspended from beams on cribbing.

TOP OF TILTED CONCRETE PIER (below) is built up with steel I-beam grillage after ends of trusses have been raised by ratchet lever hoists.



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the spans formerly rested. The I-beams were placed 24 in. apart, and after tying across their ends with 1-in. bolts, headers were placed at each end and the space between the I-beams was filled with concrete. Two groups of additional 6-in. I-beams were next placed crosswise under each span base and ½-in. sheet steel was added to build the pier section up to 30 in. Rollers were then placed under each span on 1-in. sheet steel.

When weather conditions permit, a concrete and steel form will be built around the blocking and across the pier in order to give additional support.

Some of the advantages claimed for raising the bridge by this method were:

- The entire cost of the job was less than \$1,000.00, which included filling around the bottom of the pier to prevent further washing.
- (2) The job was done by six men in less than two days, including straightening the entire bridge frame.
- (3) The men could work safely on top of the bridge.
- (4) The bridge was balanced at all times so that there was no possible danger of it toppling over.

Army Tests Equipment Operating in Mud

OF SPECIAL IMPORTANCE to contractors are investigations conducted by the Engineer Board, U.S. Army, to test the performance of heavy trucks and construction equipment operating over soft ground and through mud. Standard

and special equipment are tested.

Results to date, according to the Board, show that as yet there is no all-purpose track or tire that will give ideal off-road service and still perform well at traffic speeds on highways. Continuing tests,

similar to those shown in accompanying photographs, are being made to improve present tires, tracks and traction devices and to develop efficient roadways which can be laid quickly and expediently over extremely soft ground.



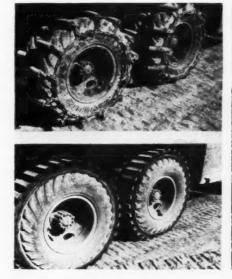
SPECIAL TRACKS 31 in. wide on Caterpillar D7 enable unit to bulldoze dyke in heavy mud during tests" conducted by Engineer Board, U.S. Army.



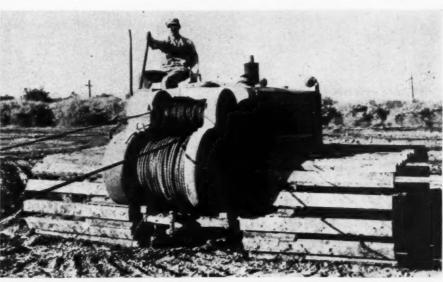
TÄNDEM TRACTORS, TD14 and TD18 Internationals fitted with 60-in. hardwood track extensions, haul Athey trailer loaded to 6 tons. Unit sinks 30 in. in soft, highly adhesive mud.



MUD SLED is towed through sticky material by D7 with track extensions. Drag of loaded sled is 3,500 lb.



TRACTIVE DEVICES to provide greater vehicle mobility in soft material include rubber-incased tire chains (top) and oversize cleated treads (bottom) held on tires by inflated tubes.

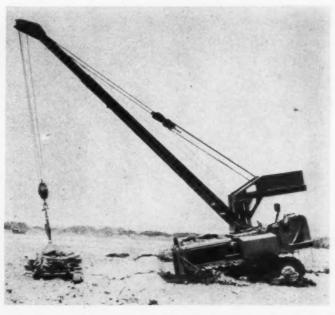


HYSTER HYDRAULIC WINCH mounted on tractor drags mired vehicles through 30-in. deep mud. Time to haul loaded 4-ton truck through 350-ft. mud hole is 6 min., including hitching and unhitching.

Photos from U. S. Army Engineer Board

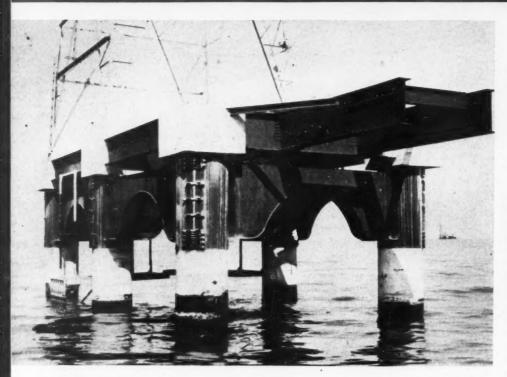


OPEN TRACTION SHOES on wheels of loaded $2^{1/2}$ -ton cargo truck pull vehicle through deep mud, while similar truck with tire chains bogs down. Vehicle has dual wheels front and rear.



TRACTOR CRANE noses into mud under heavy test load. When fitted with track extensions, unit has 85 percent of dry ground capacity, even in deep mud.

PIPE-PILE CAISSONS Support Well Rigs



HOLLOW-PILE CAISSONS resembling reinforced concrete pressure pipe form strong foundation for Creole Petroleum Corp.'s oil field equipment in Lake Maracaibo, Venezuela. Heavy portal bracing and prefabricated working platform tie structure into true rigid frame requiring no lateral bracing despite 100-ft. depth of water.

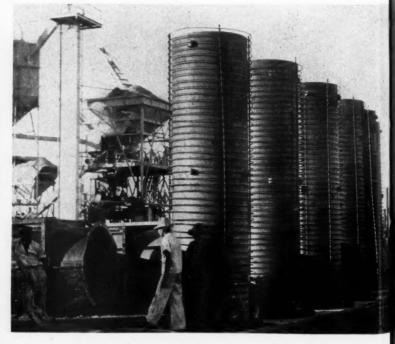
PREFABRICATED CAISSON FOUNDATIONS have proved a practical support for the heavy equipment necessary to exploit submarine oil fields. Developed under the direction of George Mc-Cammon, chief engineer of the western division of Creole Petroleum Corp., and resembling concrete pressure pipe, hollow foundation piles as long as 185 ft. and up to 5½ ft. in diameter have been successfully sunk to support drilling and pumping machinery above the deep waters of Venezuela's Lake Maracaibo. The pile section is a 41/2-in. reinforced concrete shell cast around a 1/4-in. steel plate liner. Caissons are assembled on shore from prefabricated 15-ft. lengths, floated to the foundation site, sunk plumb to firm bearing under a 200-ton superimposed dead load, and tied together at their tops by heavy portal bracing to form a true rigid-frame founda-

INNER SHELL of caisson pile (below) is 1/4-in, checkered steel floor plate. Plate is rolled into semi-cylinders, which are welded longitudinally into pipe.

Standard Oil Co. (N. J.) photo by Vachon

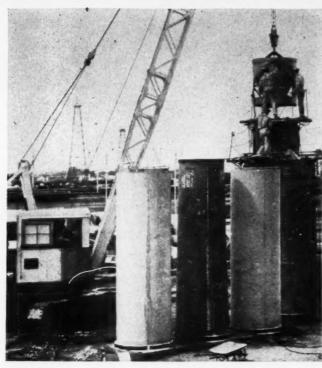
SPIRAL REINFORCING (below) of $\frac{1}{2}$ -in. steel wire is placed over up-ended checkered liner. Channels space wire on 4-in. centers. blocks hold reinforcing at center of $4\frac{1}{2}$ -in. thick concrete shell yet to be poured.





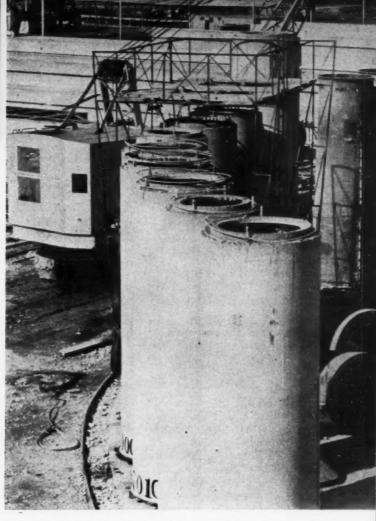
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igs in Deep Water



CONCRETE SHELL is poured after two halves of steel form are bolted and centered around liner and reinforcing assembly.

Pointed cap visible at top of second form directs concrete into pipe walls and keeps center of pipe clear of concrete.

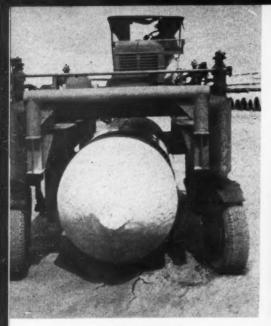


TOP AND BOTTOM 4 in. of steel liner are left exposed so that 15-ft. sections may later be welded into long caisson. Note rolling safety platform from which pours are usually made. Standard Oil Co. (N. J.) photo by Vachon

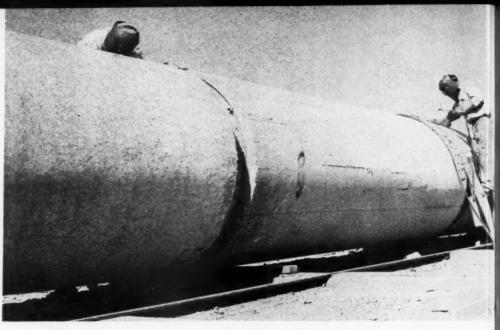
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CAISSONS ARE ASSEMBLED (below) on lake-front skids from precast sections. Sections are standardized, with outside diameters of 4.17, 4.83 and 5.50 ft. plus two tapers to join these sizes. Slim sections for caisson top minimize wave action on foundation.





CONVERTED HYSTER TRUCK carries pile sections to caisson assembly yard. This is closed end driving-point section weighing 12 tons. Standard sections weigh ½ ton per ft, and are 15 ft. long.



JOINTS ARE WELDED then filled with concrete before caisson is launched. Average caisson is 156 ft. long; longest yet driven is 185 ft. Standard Oil Co. (N. J.) photo by Vachon

tion structure that requires no lateral bracing.

Started in the shallows near the lake shore, Creole's underwater drilling operations were gradually moved to deeper waters and their oil well foundations progressed from cast-in-place concrete pedestals to timber piles, to solid concrete piles and finally, to hollow caisson-type piles. More than 200 of these caisson foundations have been installed, the majority a four-pile group supporting a 24-ft. sq. prefabricated working platform 12

feet above the level of the lake.

The oil company manufactures their own caissons in a lakefront yard. Checkered steel floor plate $\frac{1}{4}$ -in. thick is rolled to semi-cylindrical section and welded longitudinally into a 15-ft. long inner pipe shell. A reinforcing spiral of $\frac{1}{2}$ -in. steel wire on 4-in. centers is slipped over the up-ended cylinder, and a steel form is centered around the assembly to leave a $\frac{4}{12}$ -in. space between checkered liner and outer form. This space is then filled with 5,000-lb. con-

crete—a 1:2:3½ mix with 2-in, slump. The top and bottom 4 in. of the 15-ft. inner shell are not incased in concrete so that sections may later be welded together as needed to make up long pile lengths. Forms are stripped 12 hr. after pouring, and after 2 days in the casting yard the 8-ton pipe sections are moved to storage where they are water-cured for 7 days.

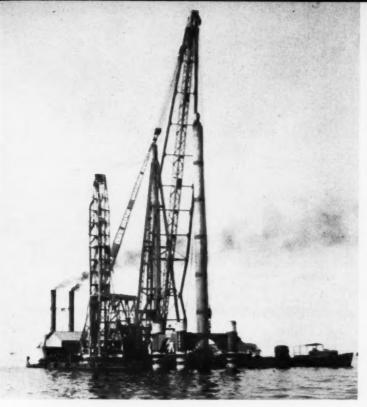
A 24-in. test pile is driven at the proposed foundation site to determine the needed length of caisson, which is made up on a shorefront skid-rack from standard 15-ft. sections and a closed-end driving point. Adjoining projecting liner plates are welded and the joint jacketed with high-early-strength concrete. After the top of the caisson is temporarily closed with a welded plate, the assembly is rolled into the lake, where it floats, and is towed to the foundation site.

Caissons are driven by deadweighting them under a 200-ton load. A 145-ft, boom on a 50ton, barge-mounted stiffleg lifts the top end of the floating caisson and, after the temporary closure plate is removed, a 4-in. hose is inserted in the pile's open top. With the pile vertical and partly submerged it is filled with water, then lowered. When the caisson will penetrate lake bottom no farther under its own weight plus that of the added water, derrick lines are removed and eight 25-ton concrete blocks are superimposed on

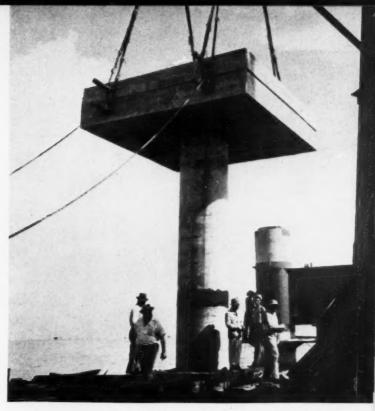
CAISSON IS LAUNCHED (below) for towing to foundation site. Temporary steel plate closes caisson top, driving point closes tip, so long pile floats.



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50-TON STIFFLEG on anchored barge positions caisson, which sinks into lake bottom under own weight plus that of water pumped into it. Lake is up to 100 ft. deep; bottom is hard clay or sand covered with as much as 100 ft. of mud.



CAISSON IS DEAD-WEIGHTED to refusal under eight of these concrete blocks, each weighing 25 tons. Pile is installed—lifted, positioned, lowered and dead-weighted—in $1\frac{1}{2}$ hr.

the pile to sink it to firm bearing. Only 1½ hr. elapses from the time the caisson is first lifted until it is dead-loaded to final position.

Prefabricated arched box-girder portal bracing ties pile tops together. One end of the bracing between piles is pre-welded to a sleeve that is slipped over the caisson and clamped rigidly to it; the other end is welded in the field to the sleeve of the brace on the adjacent pile. Because of extreme variations in lake bottom, piles are made longer than is believed required, and the excess cut off after braces are attached. The water-filled caissons are then sealed with a steel plate welded to the liner at the elevation of the

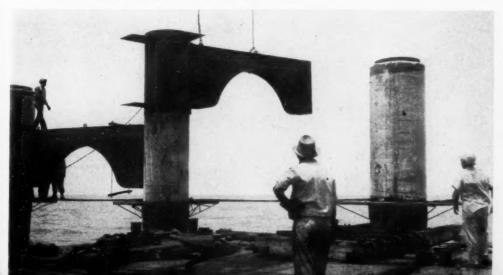
bottom of the portal brace. A prefabricated steel platform, with 24-in.-dia. pipe legs that rest on the seal plates inside the caissons, is fitted on top of the piles and the space between leg and caisson liner filled with concrete. The pour is carried up around the platform beams to tie the foundation structure firmly together.

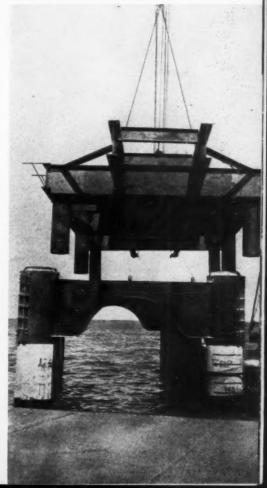
The caisson foundations were developed by the western division of the Creole Petroleum Corp., Venezuelan affiliate of the Standard Oil Co. of New Jersey, for whom E. E. Peake is division manager and George A. McCammon chief engineer. J. B. Pendleton, assistant chief engineer is in charge of field construction operations.

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PILES ARE CUT OFF (below) and pipe legs of preassembled platform are slipped into caisson. Concreting legs into caisson tops completes foundation construction.

PREFABRICATED PORTAL BRACING (below) ties caissons. Sleeves are rigidly bolted to piles; arched box-girders are welded to sleeves. Water-filled caisson is closed by plate welded to pile liner 6 ft. from top.







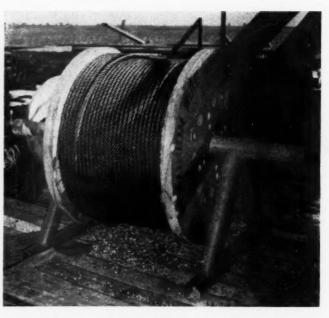
CHICAGO BOOM, mounted on post of guyed concrete-hoist tower, handles reinforcing-steel bundles on New York Life Insurance Co.'s Fresh Meadows, Long Island, housing development for veterans and members of United Nations staff. Welded channel boom 24 ft. long, with 1-ton capacity, is pinned to fitting clamped to tower leg and is jumped up as construction of 13-story reinforced-concrete apartment progresses. George A. Fuller Co., New York, is general contractor for building project.

WHITE PAVING BRICKS (below), contrasting sharply with reddish brown bricks in remainder of pavement, indicate traffic-lane separations on Canton, Ohio, street.



They Did It

CONSTRUCTION DETAILS For Superintendents and Foremen

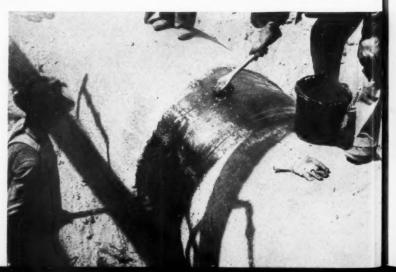


SIMPLE TRIANGULAR SUPPORTS for cable reel are welded from 4-in. pipe and are slipped over $3\frac{1}{2}$ -in. spindle passing through reel while entire unit is suspended by winch truck. Despite uneven ground or rough base upon which supports may rest, two independent side frames make assembly self-aligning and give full bearing to resist overturning as cable is unreeled. When not in use, frames take little space for stowage.—From Elton Sterrett, Houston, Tex.

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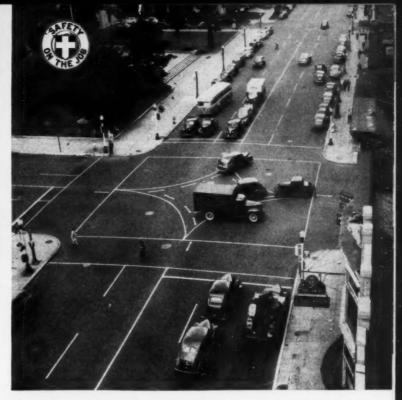
ELECTRIC FLAW DETECTOR of 10,000 v. (below, left) tests enamel as it is applied to field joint on 48-in. steel pipe at San Luis Rey siphon.

Bureau of Reclamation Photo

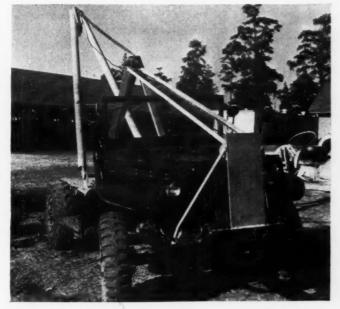




TERRY-STEADMAN, Bay City, Mich., contractors, who are strong for push plates ("Construction Methods," September, 1946, p. 88) added this big push plate to front end of Caterpillar No. 12 patrol grader to assist scrapers stuck in heavy sand on their sand-fill highway job at Houghton Lake, Mich.



VEHICLE AND PEDESTRIAN TRAFFIC flow smoothly through intersection in which all lanes are clearly marked in white. This picture won first place award in safety education classification of fifth police photography contest conducted by Northwestern University Traffic Institute, Chicago. Winner was Sterling Reid, of Kalamazoo, Mich., Police Department.



CONVERSION of ¾-ton 4x4 army weapons carrier into mobile derrick has aided district office of Corps of Engineers at Wilmington, N.C. and reduced work stoppages due to accidents. Unit, equipped with winch of 5,000-lb. capacity, is used only to lift heavy loads in repair yard. Load cannot be raised or lowered unless motor is in operation and winch lever engaged. No sudden drop of load is possible, regardless of weight. To eliminate danger of cable whip in case of break, winch speed has been slowed. Another safety factor is safety lever which must be lifted before winch lever can be engaged.



JUMBO TREEDOZER, consisting of homemade frame mounted on LeTourneau cable-controlled buildozer hoist on Caterpillar D8 tractor knocks down large trees on Council Bluffs, Iowa, levee job. Contractor, E. Ä. Kramme & Erling Jensen Construction Co., Des Moines, built rig on job.

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THIS 300-FT. CRANE (below) was built by LeTourneau to carry out steel unloading operation stalled by muddy banks and falling stages of Mississippi River near Vicksburg, Miss. With operator fore and aft, it will lift 25 tons 150 ft. into air.



ROCK IS LOADED by Northwest shovel on Mt. Mitchell road project in North Carolina's Blue Ridge Mountains. Section in background descends on 8 percent grade for 2½ mi.

Rocky Road to Mt. Mitchell

A MOUNTAIN HIGHWAY that will be the highest in the eastern United States is being blasted up the rocky side of Mt. Mitchell, N. C., to make its 6,684-ft. peak accessible to touring motorists. The road, being built as a state project by the E. W. Grannis Co., of Fayetteville, N. C., starts at El. 5158 at the Blue Ridge Parkway 28 mi. north of Asheville and

ends in a parking lot 100 ft. below the mountain's summit.

The highway, 4.7 mi. long and 24 to 27 ft. wide, is characterized by steep grades, the average being almost 6 percent. Maximum grade is 9 percent, with one 8-percent grade continuing for 2½ mi. One curve on the project has a radius of only 78 ft. although the rest are 20 deg. or less.

Most of the road construction was sidehill cutting through faulted granite that necessitated blasting with 1 lb. of 40 percent DuPont



ATHEY WAGON dumps earth fill for 6,578-ft. elevation parking lot, highest east of Mississippi River. Dump unit, with 11-cu. yd. water-level capacity, hydraulically dumps to either side under control of tractor operator.

ONLY 15 PERCENT of total 82,000 cu. yd. of excavation for mountain road is earth. Below $1\frac{1}{2}$ yd. Northwest shovel loads dirt near 6,684-ft. summit.





MILE HIGH ROAD JOB is supervised by R. M. WALTON (left) superintendent for contractor, E. W. Grannis Co., Fayetteville, N. C. G. M. GUDGER (right), is resident inspector for North Carolina State Highway Dept.

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dynamite per cu. yd. Of 82,000 cu. yd. total excavation, 85 percent was rock. In general, holes were drilled on 3-ft. centers both ways and the blast set off in 50hole rounds without delay exploders. Shots were stemmed with mud and fired by electric caps. Holes averaged 24 ft. in depth and one run of detachable bits drilled an average of two holes before resharpening was necessary. Ten 55lb. hand-held drills and one Cleveland wagon-drill were operated on a 60-hr. week to complete rough grading before winter. The hand drills, Gardner-Denvers, were supplied by two compressors of the same make having a total capacity of 815 cfm., while the wagon-drill was run from a 365-cfm. Chicago Pneumatic.

Blasted material was loaded by a 1½-yd. No. 6 Northwest shovel into 11-cu. yd. Athey wagons for dumping. These wagons, three of which were used on Grannis' job, were hauled by Caterpillar D7 tractors and side-dumped hydraulically. Two bulldozers, a D8 and an International TD18, assisted in disposal of material.

This spring, a 6-in. crusher-run base will be placed on the road and given an 18-ft. wide asphalt surface treatment. In preparation



HAND-HELD DRILLS sink holes on 3-ft. centers as drill crew prepares to blast rock outcrop. Powder consumption averages 1 lb. of 40 percent dynamite per cu. yd. in blasting faulted granite prevalent throughout project.

for this, the contractor set up a 500-ton Cedar Rapids portable crusher at Stepp's Gap, midway in the road project. Laboriously hauled to the 6,000-ft. elevation over an almost impassable logging road, the plant crushed and stockpiled the 22,000 tons of material needed.

A \$231,432 contract for grading,

crusher-run base, and asphalt surface treatment is held by the E. W. Grannis Co., Fayetteville, N. C., for whom R. M. Walton is superintendent. For the North Carolina State Highway Department, S. T. Usry is resident engineer and J. C. Walker is division engineer. W. Vance Baise is state highway engineer.

U. S. Forest Service Photo

Tough Going on Forest Road

RAPID PROGRESS is being made on the \$17,000,000 forest access road program conducted jointly by U. S. Forest Service and National Housing Agency to speed up production of timber for housing. Program includes 2,300 mi. of highways in 31 states. About 60 percent of the road work is by contract, remainder by Forest Service day labor. As the roads are intended to open up forests formerly inaccessible, many projects are being built through difficult terrain. Accompanying view shows bulldozer swamping out pioneer cut on 9.5-mi. Bumblebee Road in Coeur d'Alene National Forest, Idaho.





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TAX REVISION...

Can Make or Break American Business

S THE American way of life – progress by private initiative – going to get a fair chance to demonstrate its superiority over all the challenging varieties of collectivism?

That's the real question before Congress as it confronts the long labor of remodeling the federal tax structure. What Congress does about taxes will come pretty close to making or breaking the U.S.A.

Today the tax colossus that sprawls across the national economy is unguided by any central nervous system. Its crushing weight comes down first here, then there, as the giant wobbles around, unguided by any central purpose except to grab as much as it can.

The central purpose of a tax system is simple. It should raise the necessary revenue without placing unnecessary fetters on enterprise.

As recently as 1929 federal taxes took only one dollar out of every twenty of national income. A loose-jointed and inconsistent tax structure was a nuisance then. But it wasn't serious.

Today the federal tax burden is the dominant element in the nation's economy.

Even if Congress succeeds in cutting \$6 billions out of President Truman's \$37.5 billion budget, federal taxes still will take about one dollar out of every five of the national income. And few Congressmen are hopeful enough to think that they can get the tax load below \$25 billion for any year that is in sight.

Drastic Budget Cuts Required

Indeed, to get the tax load down to \$25 billion, Congress will have to stop treating expenditures, like those for military purposes and veterans, as politically sacrosanct. Congress must scrutinize every item in the budget. Economy must go along with tax cutting or we shall end in bankruptcy.

Suppose that expenditures are slashed to the bone. Our taxes *still* will be so heavy that the *way* they are loaded on the nation's back will make a big difference in how well the nation gets along. That's something which the postwar boom has tended to obscure. It will become much clearer as this boom wears off. Then a remodeling of the federal tax system to remove its manifold obstructions to private enterprise will be of transcendent and obvious importance to everybody.

Tax Experts Agree

The remodeling will require political courage plus tax wisdom. Congress must supply its own political

courage. But it can lean on tax experts for tax wisdom. Fortunately, tax experts now agree on the necessary reforms—especially on those that will remove obstructions to business. How well the tax experts agree is shown in the charts on the next page, summarizing answers to a questionnaire on possible federal tax reforms. The questions were asked by the Department of Economics of the McGraw-Hill Publishing Company. The answers came from a broad cross-section of tax experts, including the authors of a considerable crop of books on postwar federal taxes and what to do about them.

The experts agree (see the charts) that double taxation of corporate dividends should stop.

They agree that the tax rate on corporate income (now 38 percent) should be reduced as rapidly as possible to the initial rate on individual income (now 20 percent).

And they agree overwhelmingly that it is desirable to let net losses be subtracted from net profits over a 5-to-6-year period in computing business income for tax purposes.

All three changes would stimulate corporate initiative and hence make jobs. Averaging business incomes would make new ventures attractive even though these ventures *might* result in early losses. Reduction of the corporate income tax would have the same effect. So, too, would the elimination of that highly discriminatory provision whereby corporate dividends are taxed first as corporate profits, and again when received as income by individuals.

Penalties on Incentives

Beyond these changes, there must be an end to tax penalties on *individual* initiative. Consider the enterprising business man whose income fluctuates markedly from year to year. Because of his enterprise he may pay, on the same income, twice as much federal income tax as the man who plays it safe for a steady income. That's because he can't average his personal income over several years for tax purposes. He can count on heavy taxation of his good-year profits with no chance for offsetting against them his bad-year losses. It is a case of heads you lose, tails the tax collector wins. Eightysix percent of the experts agree that an incomeaveraging allowance for individuals is desirable.

Three-quarters of them also agree that tax rates at the top end of the individual income scale (now running up almost to 90 percent) should come down. In my judgment, the total tax should not amount to more than 50 percent to encourage business men to venture for high stakes.

Advocating tax relief for men in the higher income brackets—and particularly for management men—has been considered political suicide for more than a decade. Some members of Congress still hold that view. A Democratic Congressman from Michigan told an Illinois colleague who advocated cutting upper bracket taxes, "If you put that idea forward at home, you won't come back."

The Congressman has an even better chance of not going back if our economy bogs down. One of the best ways to bog it down is to keep the taxes that destroy business incentives and block enterprise—for example, the confiscatory rates which

drive the people in the high brackets away from risktaking.

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To give the American system of individual enterprise a fair chance was clearly the mandate of November's election. To give it that chance, enterprising business men must have a chance to make large rewards - as well as the always-present chance to lose their shirts. Under present tax rates, they don't get a break.

Prevailing federal taxation throttles bold business enterprise in other ways. It fails, for example, to encourage research and rapid industrial modernization. It tends to siphon investment away from private enterprise, driving it into tax exempt state and local securities. (The experts agree almost to a man that such

tax exemption must be eliminated.) The list of obstacles could be amplified.

Hit-and-Run Revision Disastrous

Most of the reforms needed to prevent the federal tax system from smothering enterprise would lower federal revenues, at least temporarily. Elimination of the double taxation of corporate dividends might lop off \$800 million. Dropping the corporate income tax from 38 percent to 20 percent might cut away as much as \$4 billion.

Because we can not avoid enormous federal expenses in the years immediately ahead, all badly needed reforms of the type to which this article is confined obviously can't be made at once. Also there are other tax reforms bearing on consumption which obviously should be weighted in an over-all program of tax revision.

But this is equally obvious: We should have a general design for tax revision which would line up all the necessary steps. Then we could get ahead with tax reductions as rapidly—and as sensibly—as revenue requirements and political courage would permit. Tax cutting may come piece-meal, but tax

planning must not.

Through such a design we might discover that some decidedly beneficial improvements in the federal tax structure can be made at relatively slight cost. But today there's no way to be sure. No one in Washington with access to the information has even undertaken to make the necessary estimate.

Instead, federal tax revision continues to be a hitand-run businessand a short-run political business. Take, for example, the proposal of a 20 percent tax reduction across the boards. There are virtues in such a proposal. But how they stack up beside many other extremely urgent needs for tax reform remains a mystery.

Congress must dispel such mysteries. Only in that

way will it do the job of converting our present jerry-built tax structure into a moderately safe abode for the American system of private initiative, sparked by adequate incentives.

% Of Tax Experts Favoring the **Proposed Changes** TAX EXPERTS THINK WE SHOULD: Eliminate double taxation of corporation dividends which are now taxed as corporate profit and then again as individual income. 2 Reduce corporation income tax rate (now 38%) as rapidly as budget needs permit until it equals the initial rate for individual incomes (now 20%). 3 Provide for averaging business' taxable incomes over a period of about 6 years to allow for losses in bad years. 4 Provide for averaging individuals' taxable incomes over a period of a few years so as to treat fairly those whose incomes fluctuate. 5 Reduce upper bracket individual income tax rates to a maximum of 50% in the \$100,000 bracket and 75% in the million and over bracket. 6 Treat capital gains, now taxed at a lower rate,

like other income but provide full allowances for losses.

7 Remove the privilege of tax exemption from all

future issues of state and local government bonds.

EXPERT OPINION ABOUT TAX REVISION

Mus H. W. haw. N.

President McGraw-Hill Publishing Company, Inc.

Present and Accounted For ..



APPOINTED GENERAL SUPERINTENDENT of Turner Construction Co., of New York, is D. C. ANDREWS, who has been with company since 1925. He was assigned to New York office last year, after extensive career



NEW GENERAL MANAGER of Morrison-Knudsen Co., Inc., of Boise, Ida., is JOHN B. BONNY, firm's youngest vice-president, who has been in charge of Southwestern district, with headquarters at Los Angeles.

National Society of Pro-

RITCHIE LAWRIE, JR., engineering member of firm of Lawrie & Green, of Harrisburg, Pa., engaged in engineering and archi-

CONSTRUCTION EN-GINEERING PRIZE of American Society of Civil Engineers was awarded to GEORGE K. LEONARD

Apalachia Tunnel. Mr. Leonard is project manager in charge of construction of Watauga and South Holston dams for

Engineers is

fessional

since 1922.

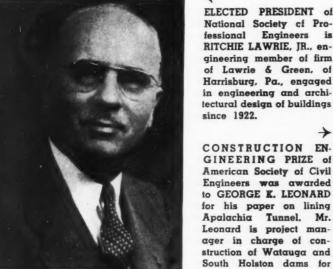


NEW DIRECTOR of Louisiana State Department of Highways is P. A. FRYE, former executive director of natural gas conservation for state.

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ALAN J. POTTER (below), recently reelected president of Associated General Contractors of Massachusetts, has also been elected vice-president of Massachusetts Building Congress and is vice-chairman of CPA technical advisory committee for New England. He is assistant to president of Aberthaw Co., Boston.



NEW YORK STATE CHAPTER of Associated General Contractors of America has named DONALD G. DAVIS (below) as its 1947 president. He is president of Binghamton Construction Co., Inc., Binghamton, N. Y.



NAMED CHIEF ENGINEER of Delaware State Highway Department is W. A. Mc-WILLIAMS (below), who joined the department 19 years ago. After his discharge from Army in December, 1945, he became assistant chief engineer in charge of construction and maintenance.







TWO PAGES OF PERSONALITIES



ON CONSTRUCTION SITE for new Le-Tourneau plant at Stockton-on-Tees, England, R. G. (BOB) LETOURNEAU takes helm of Muir-Hill dumper, which appears greatly to resemble similar unit built by one of R. G.'s competitors in United States.

ALLEN GOLDEN, general superintendent of M. H. Golden Construction Co.. Los Angeles, Calif., directed driving of 70-ft. - long concrete piles for four 1,400-ft. Navy piers at San Diego.



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APPOINTED CHIEF ENGINEER of American Bridge Co. with headquarters at Pittsburgh, Pa., is DR. C. EARL WEBB, who was formerly western division engineer for this U. S. Steel Corp. subsidiary.

NAMED TO HEAD Southeastern Association of State Highway Officials is G. T. McDON-ALD, engineer-director, State Highway Department of Georgia. He has been engaged in highway construction and administration in Georgia for 20 years.



NAMED ASSISTANT TO PRESIDENT of Merritt-Chapman & Scott Corp., of New York, is FRANK W. BARNES (below), who joined firm as construction manager in 1937. He received The Moles' member Award for outstanding construction achievement in 1943.

ONLY CIVIL ENGINEER in U. S. Senate is GEORGE WILSON MALONE (below) of Nevada, who took his seat in January. A native of Kansas, he was graduated from University of Nevada in 1917 and became Nevada state engineer in 1927. Since 1937 Senator Malone has been managing director of Industrial West Foundation.

LABOR RELATIONS for Turner Construction Co., of New York, will be directed by F. E. SCHILLING, vice-president, who has been associated with company for 39 years.







LEGAL ADVENTURES OF TRACTOR CONN



By recounting the experiences of Tractor Conn. who symbolizes the average contractor, this series of articles, each based on the decision of an American court and presented in plain, non-legalistic terms, is designed to help construction men avoid costly legal pitfalls.-Editor

The Case of the Useless Wire



"My \$5,000 account has been past due for several months," the owner admitted.

"It certainly has," Tractor Conn agreed.

"Take a check on the Popular Bank of Pershing?"

"Pershing's a long way off," Conn demurred, "but drop in this afternoon, and

I'll let you know."

The owner departed, and Conn lost no time in sending the following telegram to the Popular Bank of Pershing:

"Have been offered check of John Doe on your bank for \$5,000. Is it good?"

"The check is good," the bank wired back.

Ten minutes later the owner strolled in, Tractor Conn accepted his check, which went forward for collection, and came back marked "no funds."

"You wired me Doe check was good and will look to you for payment," Conn wired.

"Our first telegram did not promise payment and

we recognize no liability," the Popular Bank replied. "Now, there are the facts and correspondence. What I want to know is whether I have any case against the Popular Bank," Tractor Conn told his lawver.

"You have not, I am sorry to say," the lawyer assured him.

"But, I've heard of instances where a bank had to stand behind a telegram in a case like this," Conn demurred.

"There are lots of cases in the books where the bank was held liable," the lawyer explained, "but in all those cases the bank's telegram contained an express or implied promise to pay the check. In your case, however, all the bank said was that the check was 'good', from which you cannot extract anything that looks like a promise to pay the check when presented. You are in practically the same position as if the bank had wired, 'the check is good right now, but we will not guarantee that it will be good for ten minutes."

"Looks as if I were the victim," Tractor Conn admitted.

"Of course, you still have the right of action against the owner who gave you your check," the lawyer reminded him.

"And he went into bankruptcy yesterday," groaned Tractor Conn.

The Case of the Questioned Waiver



If Tractor Conn is entitled to a mechanics' lien on a building erected by him and takes other security for the claim, whether Conn has thereby waived his lien depends on the state in which the building stands.

Illinois, Kentucky, South Dakota, and Wisconsin, for

instance, are states whose courts have ruled that there is a waiver; while the Georgia, Iowa, Maryland, Minnesota, Mississippi, Nebraska, New Jersey, and Tennessee courts have ruled that there is no waiver unless such was the intention of the parties or the new security is inconsistent with the lien.

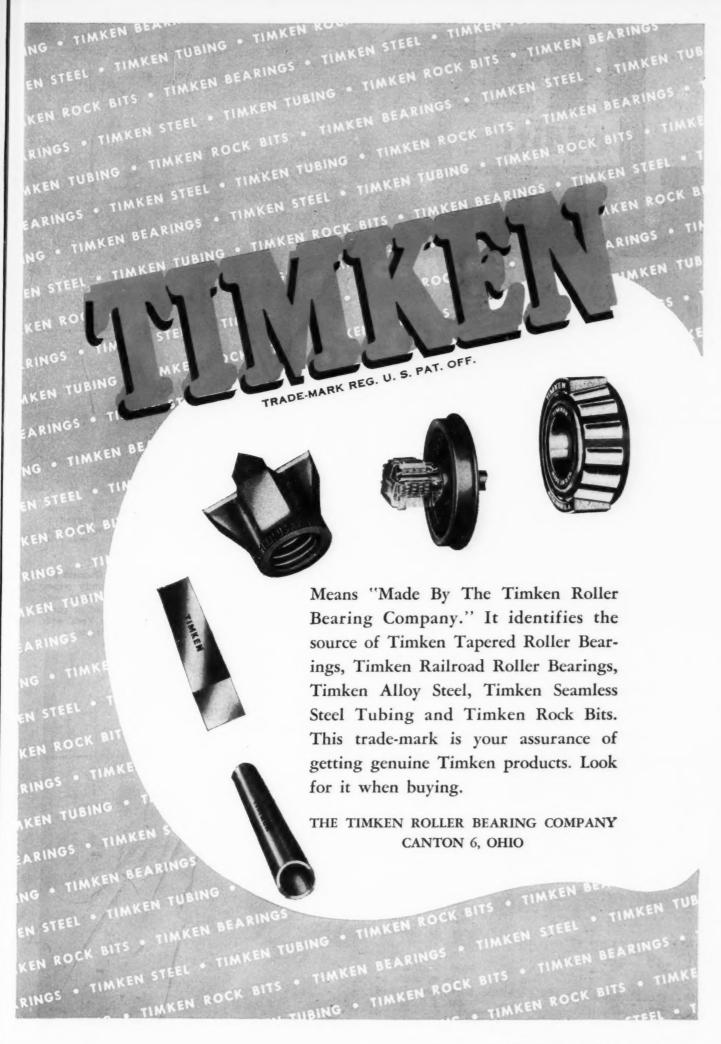
In Illinois, one of the states where the security waives the lien, Tractor Conn was entitled to a lien on an Illinois building erected by him and the owner of the building assigned the fire insurance policies on it to Conn.

Then Tractor Conn attempted to enforce his lien.

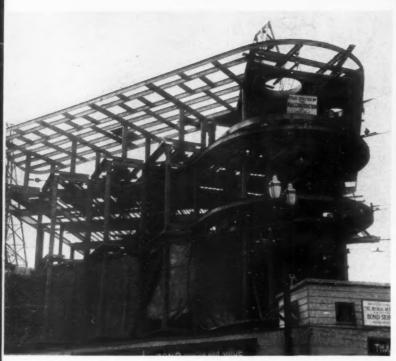
"You waived the lien when you accepted the policies as security," the owner contended.

"There was in fact no security. The policies could not become a security unless the building was burned, which might not happen during the life of the policies," said the Illinois courts in ruling in Tractor Conn's favor.

> More Legal Adventures of **Tractor Conn Next Month**



oddities



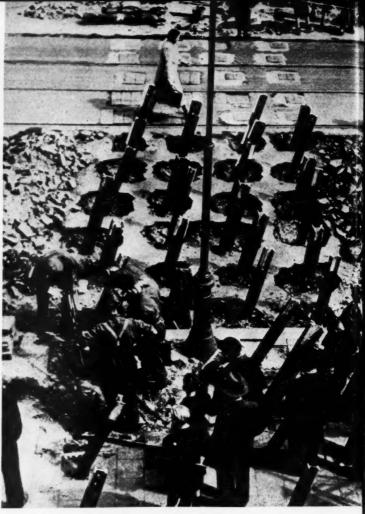
MOST COMPLICATED and probably most expensive steel erection job for its size in Cleveland, Ohio, is framework for Bond's new store. Setbacks, angle display windows and circular corner may result in striking appearance, but they are headaches to Mak Construction Co., which is subcontractor on steel erection for The Hickox Building Co.

Photo by Bill Todd, Plain Dealer



DIRECTION AND INFORMA -TION SIGN erected by Army Engineers guides visitors to proposed Fort Randall Dam on Missouri River in South Dakota. Sign is at edge of Pickstown, named after Brig. Gen. Louis A. Pick, U.S. Division Engineer, Missouri Valley Division. author of Pick-Sloan plan for develop-ment of Missouri Valley. First part of construction town is being built by government - hired labor.

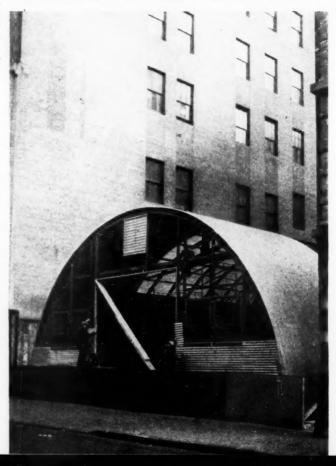
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CONSTRUCTION
METHODS
March 1947

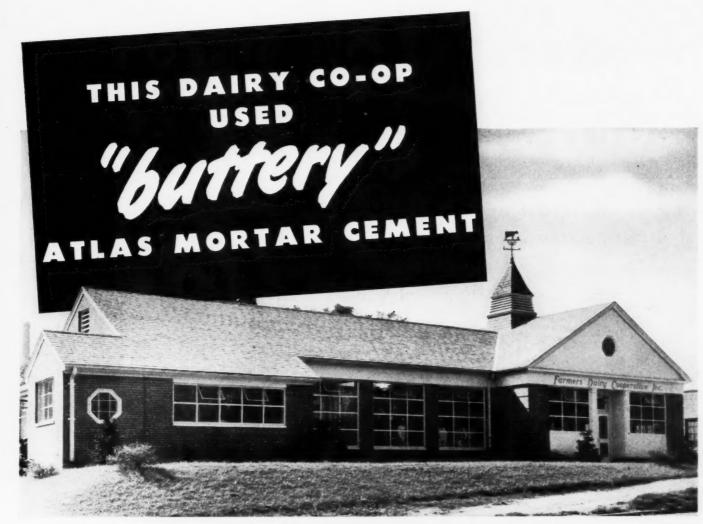


GERMAN WARTIME TRAFFIC OBSTACLES, nicknamed "asparagus," are uprooted in Amsterdam as part of Holland's reconstruction program. They are serious hazard to city's 800,000 bicyclists.

British Combine Photo

SHADOWED BY SKYSCRAPERS, 40x80-ft. Stran-Steel Quonset hut (below) is erected in midtown Manhattan as temporary paper storage building for New York Herald-Tribune. Reinforced concrete foundation slab is designed for 250-lb. live load to carry heavy rolls of newsprint. Robert Johnson, Inc., New York, with Douglas MacFerran as superintendent, is general contractor.





Farmer's Dairy Cooperative, Inc., Chapel Hill, N. C. Contractor, H. L. Coble, Greensboro, N. C.

The contractor on this job was well pleased with the mortar...the super-intendent on the site said it was the best mortar he ever used...and the brick masons also praised Atlas Mortar Cement.

hut

Smooth as satin, plastic as butter, Atlas Mortar Cement promotes easier, faster handling—speeds work. It produces a superior yield—particularly important on large jobs.

Atlas Mortar Cement also rates high in other desirable characteristics—water retention, volume change, color, strength and durability. It is backed by years of research, and complies with Federal and ASTM specifications for masonry cement.

Send for descriptive circular. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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CM-MC-12



"THE THEATRE GUILD ON THE AIR" - Sponsored by U. S. STEEL - Sunday Evenings - ABC Network

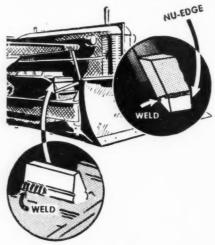
CONSTRUCTION EQUIPMENT NEWS

MARCH 1947 REVIEW of Construction Machinery and Materials



CURING COMPOUND APPLICA-TION MACHINE-Distinctive feature of Tru-Cure curing compound application machine is multiple nozzle spray which is hidden by hood or windshield. Nine nozzles are arranged to provide complete coverage of 5-ft. swath sweeping transversely across road strip. Gasoline engine, pump and tank are mounted on wheels operating on railway running back and forth on bridge crossing roadway. Bridge in turn is on wheels and operates on rails. It is moved ahead by crank and ratchet mechanism. Curing compound is deposited at rate of 200 sq. ft. per gal, providing film heavy enough for proper water retention. One operator, it is claimed, can readily keep up with concrete road-laying team. The Truscon Laboratories, Detroit,

BLADE SALVAGE—Re-Nu Edge Bar can be welded to square or worn edge of bulldozer, drag or maintainer blade with all-purpose high-grade steel electrode, such as AWS 6012 or 6013. To prevent wear on weld, this bead is then covered with thin layer of hard-surfacing



electrode. Same material is also used around ends or corner castings where most severe wear takes place. This work-hardening steel edge will prolong life of blade many months, thereby effecting considerable savings in cost of blade replacements.

—Allied Steel Products, Inc., 7835 Broadway, Cleveland 5, Ohio.

TWO-WHEELED TRACTOR — New small Tournapull for high - speed dirtmoving, Model D, is powered by 85-hp. gasoline engine and equipped with new E-4 Carryall scraper, having load limit of 4 tons and struck capacity of 3.3 yd. Unit is self-loading, has four speeds forward, four reverse, and travels up to 23 mph. Outstanding feature is new electric control by individual electric motors



-revolutionary operating principle which replaces conventional tractor steering and gear shift levers and eliminates need of power control unit for scraper operation. Operator steers, shifts and handles all scraper controls by buttons on electric control panel. New type differential keeps both wheels pulling at all times; on slippery going most power is supplied to wheel on firmest footing. Neither wheel will spin independently of other. Air brakes add to safe operation. Ability to turn on 25-ft. fill and to turn in its own length (22 ft. 5 in.) from full stop makes this rig extremely maneuverable. New type and size pneumatic rubber tire is used-14.00x32 tire with tapered beads which seats itself firmly against wheel rim at low air pressures.-R. G. Le Tourneau, Inc., Peoria, Ill.

TROLLEYS FOR MONORAILS— Latest in trolleys for carrying tail blocks on monorails in power drag scraper systems is Sauerman trolley, designed to ride monorail on four double-flanged steel wheels. Trolley



mounts Durolite block, through which drag scraper cables pass. Trolley is adaptable to hand or power shifting and will easily pass over changes in direction of monorail.—Sauerman Bros., Inc., 532 S. Clinton St., Chicago 7, Ill.

Thermoid - for Progress in Industry



In 1903, pipe-fed air drills like these weighed from 300 to 1500 pounds and struck from 250 to 400 blows a minute.

Today modern hosefed jack hammers weigh only 30 to 72 pounds and strike 1800 blows per minute.



THINK of the time saved by mobility of equipment afforded by flexible, tough, abrasion-resistant Thermoid air hose over clumsy, slowly moved metal pipes.

What better picture can we give you of how Thermoid research and industrial rubber knowledge have contributed to "Progress in Industry."

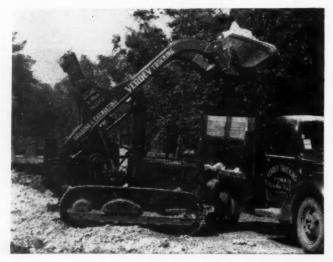
Whether you operate a quarry, mine, creamery or brewery... are in agriculture, construction, oil or any manufacturing industry, consult your local Thermoid Jobber or direct factory representative on all problems relating to hose, belting or friction materials. When you do, you'll find—"It's Good Business to do Business with Thermoid."

THE THERMOID LINE INCLUDES: Industrial Brake Linings and Friction Products • Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose

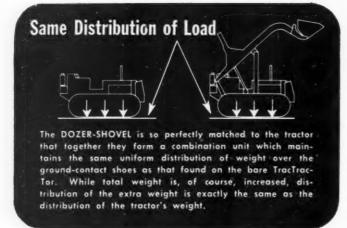


Contributor to Industrial Advancement Since 1880

The Tractor is Harnessed...



Almost exactly the same center of gravity as that found on the TracTracTor alone is maintained. The effective traction and stability of the bare tractor are retained. There is no loss of power, no excessive wear, no loss of the efficiency originally built into the tractor.



See Your
INTERNATIONAL
TRACTRACTOR
Distributor

Not Shackled

When an International TracTracTor is equipped with a Bucyrus-Erie DOZER-SHOVEL, all the speed, power and flexibility of the TracTracTor are retained because its original characteristics remain unchanged:

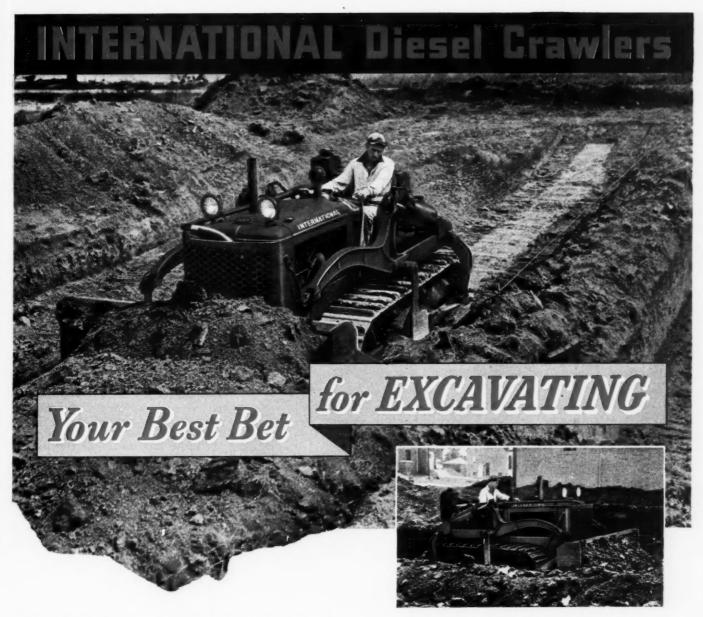


Retention of original tractor characteristics is just one of the many reasons why the versatile DOZER-SHOVEL (for T6, TD6, T9, and TD9 TracTracTors) is UNIQUE among front-end loaders. Let your International TracTracTor Distributor tell you about some of the other reasons, too: three-way service,* full front visibility, low overhead clearance, positive down pressure, simple rugged design, easy interchangeability.



SOUTH MILWAUKEE, WISCONSIN





Enough said when you say, "It's an International Diesel Crawler!"

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Equipped with a bulldozer blade, it's your best bet for digging basements and other excavations.

With an International Diesel, whole blocks of basements can be dug in one operation—and economically. Then the same crawler can be used to spread the spoil and fill in between foundations or to push it over ramps into trucks for removal. And it can finish the job by building streets and landscaping the whole area.

No wonder many contractors who specialize in basement digging prefer the International Diesel Crawler.

Greatly favored for this work is the International TD-14 because its size is within limits which permit

You can see for yourself in these photographs how the International TD-14 with a bulldozer blade gets on with a basement digging job. Here the average distance from cut to spoil was 60 feet, depth to dig was 6 feet, yardage dug was 420 cubic yards of clay. Total time required was 6½ hours.

ready transportation on the streets and highways of most municipalities and states. Yet it is a powerful, fast working crawler, fit for your toughest assignments.

Ask the International Industrial Power Distributor near you to supply specifications and complete information about this and other International Crawlers, Wheel Tractors, Power Units and matched equipment.

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180 North Michigan Avenue

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Industrial Power

"SUBWAY"



The Pay Line From Compressor to Drill!

GOODALL has built into "SUBWAY" AIR HOSE all the qualities that long experience and a thorough knowledge of the service requirements specify.

WRAPPED DUCK CONSTRUCTION Sizes ½" to 1¼",

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The specially compo

A THE NAME TO

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A AIR HOSE!

The specially compounded tube is tough, long-wearing, oil-proof. The husky, high-quality duck carcass provides the extra strength for which the hose is famous; and the smooth, rugged red cover will withstand the utmost in rough handling and severe abrasive wear. A leader in the "Standard of Quality" line.

OTHER GOODALL PRODUCTS FOR CONTRACTORS include Steam, Water, Suction, Grout, Jet and Concrete Placing Hose; Dredge Sleeves; Conveyor and Transmission Belting; Waterproof Boots and Clothing.

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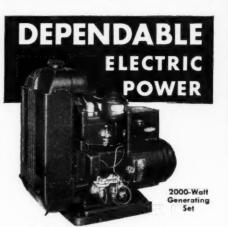
Factory — Trenton, N. J.

Established 1870

COMPRESSOR LINE—New line for 1947 includes five models of 60, 105, 160, 210 and 315-cfm. capacity. All units are of V-type cylinder design, except Model 315, which is of "W" construction with four low-pressure and two high-pressure cylinders.



Units operate at relatively slow piston speeds through use of short piston strokes (4½ in. for Models 60 and 105; 4 in. for Models 160, 210 and 315). Aluminum alloy compressor heads and manifolds are utilized in all models. — Davey Compressor Co., Kent, Ohio.



FAIRBANKS-MORSE GENERATING SETS

PERFORMANCE-PROVED to meet your requirements. Capacities, 350 to 35,000 watts. Compact, single-unit design, sturdy construction. Give unfailing service even under continuous, heavyduty operation. A.C. and D.C. types, remote and automatic start. Send coupon for FREE literature today!

Fairbanks-Morse

A name worth remembering

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unrestricted.





Yes, Rex Moto-Mixers have the fastest discharge

of any truck mixer... even with lowest slump

mixes. The big 34-inch discharge opening is

Rex Moto-Mixers are the only truck-mixers

that mix in the discharge direction so that the

batch is always right up at the opening . . . ready to come out in a hurry the second the discharge

is opened. There is no hesitation . . . no segre-



CONSTRUCTION

"I told 'em that Rex had a fast discharge!"





CHAIN BELT COMPANY of MILWAUKEE



gation. Deep spiral scoops get the batch out fast.

Combine this exclusive high-speed discharge

with the other outstanding Rex Moto-Mixer fea-

tures . . . fast charge, Hi-Lo mixing, accurate water system, chain drum drive . . . and you'll

see why you'll get more trips per truck per day.

or write for Bulletin No. 46-8. Chain Belt Company, 1664 W. Bruce St., Milwaukee 4, Wis.

For all the facts, see your Rex Distributor

MOTO-MIXERS







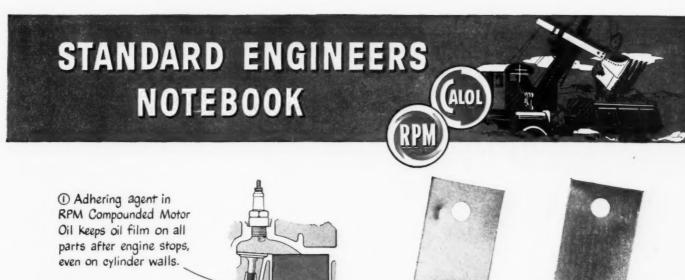
KINETIC MIXER—Portable 3-cu. ft. machine is designed to handle all types of cold asphalt mixes, including sheet asphalt and asphaltic concrete. It is claimed that new mixing principle provides thorough coating of all aggregate particles with asphalt, making possible for first time in small mixer completely successful use of chemical additives to eliminate need for drying wet aggregates.



In addition to its use for patching and paving asphalt areas, mixer has been successfully employed on asphaltic floor emulsions, feeds, foods, sand, chemicals, concrete, and other construction and industrial mixes. Capacity under good conditions is as high as two batches per minute. Operating cycle at this speed is 5 sec. for charging from wheelbarrow, 20 sec. for mixing, and 5 sec. for discharging hand-controlled chute at top of machine. Mixing action is accomplished by revolving drum and three stationary blades. Asphalt is introduced into drum by Yale & Towne tri-rotor pump at maximum rate of 8 gal. in 6 sec. Mixer is powered by 12-hp. gasoline engine or can be equipped with electric motor. Overall height is 58 in., length 81 in., width 68 in. Approximate weight is 1,500 lb.-Foote Co., Inc., Nunda, N. Y.

TRACTOR BACKHOE - The Sargent backhoe consists of permanent tractor hookup attachment plus boom and special ditch-digging bucket which substitute for regular shovel arms and bucket of over-head shovel. Attachment weighs 165 lb, and can be attached by one man in one hour. It does not interfere with use of tractor for other purposes so it has to be put on only once. Backhoe boom and bucket, weighing 1,435 lb., for Model B, can be attached in one hour and can be detached in about 10 min. Backhoe bucket is equipped with automatic bucket cleaner that cleans bucket at every dumping. Dumping of bucket is either manual or automatic. Maximum digging depth is between 7 and 8 ft., depending on type of material. At present backhoe is available in two sizes, Model B and Model D, to fit Cletrac tractors.-Maine Steel, Inc., South Windham, Maine.

ELECTRIC TAMPER & EQUIPMENT CO. MICHIGAN



② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

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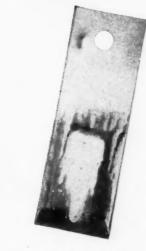
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③ No rust is formed to scrape off when engine starts, and cause excessive wear.

Constant lubricant film provides adequate and instant lubrication when engine starts.



This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.



RPM COMPOUNDED MO-TOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

Trademark "RPM" Reg. U. S. Pat. Off.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Colo.; Standard Oil Company of Texas, El Paso, Texas.

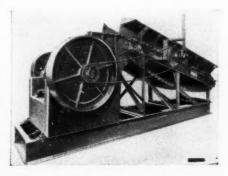
FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT



GEORGE HAISS MFG. CO., INC., 139th St. & Canal Place, New York 51, N. Y.

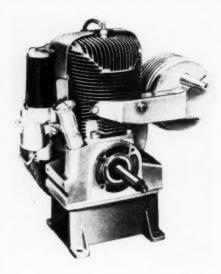


APRON FEEDER — New development in apron feeders is built around unit assembly without sideboards. Feeder can be furnished with vertical or flared sideboards, thus making three models available. Each of these models can be furnished with any one of three drives—for gear motor, for conveyor drive, or for drive from crusher, providing nine combinations in five lengths from 6 to 14 ft.



and in four widths from 30 to 48 in. Pans are ½ in. forged steel plate, formed to overlap to impart great strength and rigidity. These pans, with side-boards, provide continuous path for materials and reduce spillage. They also provide corrugated surface which prevents slippage under load. Interlocking malleable castings, bolted to pan ends, form continuous wall along each edge of feeder bed and further reduce spillage.—Pioneer Engineering Works, Minneapolis 13, Minn.

GASOLINE ENGINES—Four models of two-cycle engines range from 2½ to 4-hp. and are designated as Series 1200. Basic advantages claimed are: Exceptional light weight; superior starting and idling



characteristics; compact size; adaptability for additional applications; and simplicity. Light weight is derived chiefly from extensive use of aluminum-alloy die-castings. — Mc-Culloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif.

Porto-Power is a Complete System of Portable Hydraulic Power for EVERY PLANT

HE unmatched array of Porto-Power equipment serves in every phase of construction and maintenance work. Myriads of units and attachments - in 2, 4, 7, 10, 20, and 50-ton capacities give Porto-Power an exclusive versatility and profit-making ability unapproached by any other equipment. Compact, powerful, portable — one man can carry

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COMPACT quarters and need for moderate force require Bantam, Above-Loosening stoker ram.



MACHINERY is lifted by the 4-ton midget ram, low height of 15/8".



MAINTENANCE — The 7ton short ram pushes pins, etc. in tight spots.



PULLING-10-ton Porto-Power pulls without loss of power.



TOE on 20-ton ram lifts 10 tons from 31/2" low.



PULL heavy gears - using 50-ton Porto-Power.



RIGID 1"-2" PIPE is range of 10-ton Porto-Power Pipe Bender.



RIGID 11/4"-4" PIPE handled by 20-ton Porto-Power Pipe Bender.



YOUR GUIDE TO FASTER, BETTER WORK! This new Blackhawk catalog gives you the complete story on Porto-Power. It contains information on the entire Porto-Power line including sensational new Postwar developments. And in addition it is chuck-full of tips and suggestions on extra uses for your Porto-Power that create big extra savings and safety measures for you. Write today for your copy of this Blackhawk Porto-Power Catalog. Order Porto-Power from your Industrial Supply Distributor.

*There is only one Porto-Power . . . it is made by Blackhawk. Trademark Registered.

Blackhawk Mfg. Company, Dept. P2337, Milwaukee 1, Wis.

with Porto-Power



The Parmanco Single Speed Transmission Drill is designed to meet the requirements of the general prospecting field where it is not necessary to drill in solid limestone. Special sliding frame permits drilling and pulling of augers without moving drill. New design of chuck eliminates all hand operation in raising power plant. Recommended for 50 to 60 feet with four and one-half inch equipment. Under favorable conditions it is being used to greater depths.

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

FOLDING CHUTE — Dumpcrete folding chute is outstanding example of good design. It opens from its traveling position and is ready for pouring in few seconds. Folding fea-



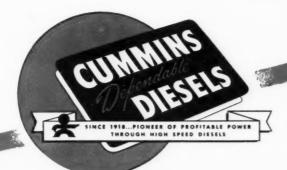
ture of this chute in no way interferes with its horizontal swing of 180 deg., nor with its full vertical adjustment. — Maxon Construction Co., Inc., 131 N. Ludlow St., Dayton 2, Ohio.

CABLE CONTROL—Rear-mounted double drum cable control unit for use with "Caterpillar" Diesel D6 and D7 tractors, known as No. 23, is designed to develop line pulls ample to meet service requirements imposed by operation of scrapers, bull-dozers and rippers. — Caterpillar Tractor Co., Peoria, Ill.

GRIFFIN WELLPOINT SYSTEMS **JETTING** PUMPS SALE - RENT Distributors GRIFFIN ENGINEERING CORP. 2016 E. Adams St. JACKSONVILLE, FLA. GRIFFIN **EQUIPMENT CO., INC.** 548 Indiana Street HAMMOND, INDIANA GRIFFIN WELLPOINT CORP.

881 EAST 141st ST. . NEW YORK 54, N.Y.

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Profitable POWER



Handling heavier loads faster . . . operating

on smaller quantities of low-cost fuel full ... designed for easy



servicing, Cummins Dependable Diesels are the source of profitable power on hundreds of jobs such as yours.



HE NEW ONAN AIR-COOLED "CK" ENGINE 10 H.P. 4-CYCLE

Two-cylinder horizontal opposed design gives the new, heavyduty CK engine unusual running smoothness. Short, rigid crankshaft . . . 2-inch diameter main and 1%-inch diameter rod bearings . . . pressure lubrication . . . axial-flow cooling fan . . . aluminum construction giving 4-to-1 cooling advantage over cast iron . . . weighs only 97 pounds and fits neatly into 15" x 19" x 18" space. Designed to solve engine power problems in industry, agriculture and other fields. Proven by thousands in use today ... now in mass production

Also has: Built-in precision governor . . . downdraft concentric carburetor ... prompt delivery. for wide-angle operation . . . oil bath air cleaner . . . fuel pump . . . oil pressure gauge ... crankcase fumes exhausted to carburetor . . . her-

ONAN ELECTRIC PLANTS—A.C.—350 to 35,000 watts in standard voltages and frequencies, D.C.—600 to 10,000 watts, 115 and 230 volts. Battery chargers 2-qt. oil capacity.

ONAN AIR-COOLED ENGINES — CK: 2-cylinder opposed, 10 h.p.; BH: 2-cylinder -500 to 3,500 watts, 6 to 115 volts. opposed, 5.5 h.p.; 18: 1-cylinder, 2.5 h.p.

WRITE FOR illustrated, specificatio



Electric Starting

Built-in electric push-button or automatic starting is optional; adds little to overall dimensions.



D. W. ONAN & SONS INC. 4952 No. Royalston Ave.



ONANA Cycle ENGINES

POSITIVE PRINTING MACHINE-Streamliner can reproduce drawn,

typed, printed or photographic material in 25 sec. at cost of one cent for 8½x11-in. reproduction. All con-



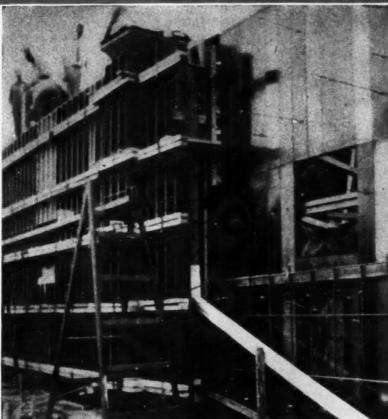
trols are within easy reach operator. Machine accommodates material up to 42 in. wide. It is wired for 220 v., a.c., 60 cycles, single phase. Width is 62 in., height 501/8 in., depth 31 in. and weight 745 lb.—Ozalid, Division of General Aniline & Film Corp., Johnson City, N. Y.

REAR AXLES—New line of Timken 3-for-1 rear axles in complete range of sizes for truck capacities extending from GVW rating of 14,500 lb. to GCW rating of 58,000 lb., with each size axle available with three types of final drives, is announced. There are seven basic axles in new line, E, H, L, Q, R, S and U series. E Series through R Series offers choice of three types of final drives,

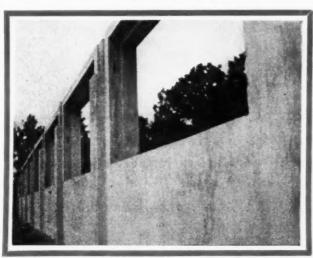


including hypoid single reduction, hypoid-helical double-reduction and two-speed hypoid-helical double-reduction. S and U Series heavy-duty axles offer choice of hypoid-helical double-reduction or two-speed hypoid-helical double-reduction final drive. In each series optional types of final drives are interchangeable in same axle housing using same axle shafts. It is from this feature of interchangeable final drives that 3-for-1 axle derives its name.—Timken-Detroit Axle Co., 100-400 Clark Ave., Detroit 32, Mich.

ATLAS LABOR-SAVING SPEED FORMS



No studs, joists or heavy scuffolding needed with Atlas Speed Forms. Note access holes for short drop of concrete.



De Cristofer Const. Co. says-

"The cooperation of your field organization has been most satisfactory and they at all times tried to help in the layout, and to provide us with the necessary items required; as well as passing on suggestions."

Very truly yours,

DE CRISTOFER CONSTRUCTION CO. (Signed) J. M. Doyle"

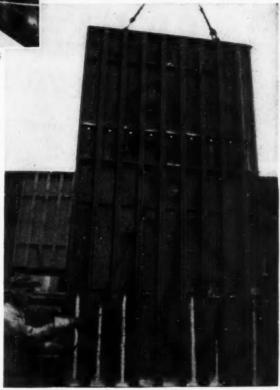
De CRISTOFER CONST. Co.

Cuts Cost Of **Concrete Construction** With Atlas Speed Forms

SPEED Forms used for walls 14 ft. high gave maximum low cost results on the new Calco Chemical Co. plant at Bound Brook, N. J. The Steel Forms-good for an indefinite number of uses, were assembled in large panels, as pictured, and moved by crane. No heavy scaffolding or bracing needed. Erection, stripping and moving goes fast and easy. Finish is smooth and uniform—no grain marks, or knot holes.

Speed Forms Are Available Now For Rent or Sale

Write to us about your next job, and ask for IHustrated Folder.



Forms in large panels are moved by crane or traveler, but are light-weight and can easily be erected, stripped and moved by any man in smaller units.

Irvington Form & Tank Corp.

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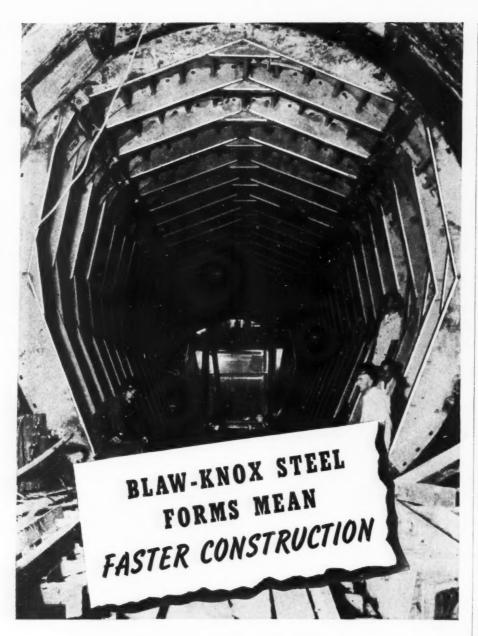
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IRVINGTON 31. N. Y.

NEW YORK CITY SALES OFFICE - 43 CEDAR STREET Tel. BOwling Green 9-4030

Call on us for concrete forms for every purpose-wall, floor, column, pan, pipe, tunnel, caisson, bridge, road, sewer, etc.

Atlas Labor-Saving Concrete Forms for every Purpose



Sound engineering, rugged construction and a reputation for smooth practical performance is the unbeatable combination which Blaw-Knox steel forms give to contractors on big jobs.

Whether the job calls for heavy forms on tunnels and conduits, on low retaining walls or high multiple arch dams, Blaw-Knox forms assemble and strip readily, save time and manpower, and generally speed and improve the work.

-KNOX

BLAW-KNOX DIVISION

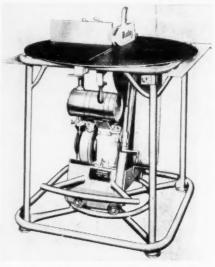
OF BLAW-KNOX COMPANY 2086 Farmers Bank Bldg.

2086 Farmers Bank Blde Pittsburgh 22, Pa.

SEND for Catalog No. 2035 on steel forms for heavy construction.

BLAW-KNOX STEEL FORMS

PORTABLE SAW — Outstanding feature of new saw is rotating table. Circular table top and saw mechanism rotate as unit. With this design, various cuts are made by simply rotating table. When changing cutting angle from ripping to cross-cutting to mitering, it is only necessary to rotate table to desired angle, drop lock pin in place and make cut. This requires only few



seconds and is done without shut-ting off power. When making these various cuts, lumber always remains lengthwise on roller conveyor work tables, thus eliminating unnecessary handling of long lumber when making frequent changes in cuts. Two men can easily lift saw off a truck or move it about job as desired. Its welded steel construction provides sturdiness and light weight. When equipped with 12-in. blade, saw will cross-cut to width of 16 in. or rip to depth of 4 in. It is powered by 3-hp. gasoline engine or 1½ hp. electric motor. As standard equipment, it is supplied with two 10-ft. steel work tables fitted with ball bearing steel rollers.—Nordberg Mfg. Co., Milwaukee, Wis.

REFILL DRAWING PENCIL—New refill drawing pencil, which eliminates two-handed screwing and turning operation, is marketed under brand name Castell Locktite. It is designed with clutch which opens by simple pressure of thumb on button release. Holding point to paper, lead may be adjusted by upward or downward movement of hand, eliminating need to touch graphite with risk of smudging drawing. Finely precisioned collet supports graded lead all around and prevents breaking or snapping off under greater-than-normal pressure. It holds graphite in tight grip and prevents it slipping back in holder. Pencil is plastic with metal and goldplated parts. - A. W. Faber, Inc., Newark, N. J.



THIRTY NEW SOUTHWEST BOTTOM DUMP
WAGONS are doing a big job for Macco
Corporation and Morrison-Knudsen Co. at
Mills Field, California. Each unit averages
70 YARDS PER HOUR, BANK MEASURE,
ON A SIX TO EIGHT MILE ROUND
TRIP HAUL. That's how to move
"muck" and cut costs in
a big way!

Southwest Wagons are engineered to fit YOUR tractor and suit YOUR needs.
30-CU. YD. water level—38-CU. YD. heaped capacity—Special heavy duty construction—Easy operating, air controlled bottom dump doors—Heavy duty bogie wheels—Air operated brakes. •
Write for Bulletins on complete line of Southwest Construction Equipment.

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA

















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BULLDOZERS

CRANES

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DUMP WARDN

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BCHAPEN

PICK OUT A TOUGH JOB

THEN PICK A GENERAL

TO DO THAT JOB



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You know the kind . . . that job on which you've never been able to get production up where you'd like it . . . the one that's been 'raising Ned' with your present equipment! That's the kind of a job where a GENERAL really stands out!

You've got a job like that . . . where operating conditions are especially bad . . . where usage is exceptionally severe. The record proves that GENERALS can take punishment,

day after day, and still turn in a creditable performance: 98% OF ALL THE GENERAL MACHINES EVER BUILT ARE STILL IN SERV-ICE! That's a record worth thinking about in planning the purchase of new equipment. It's a record that proves a GENERAL can handle your job—faster, better, cheaper. See your nearest distributor or write to us direct today for the complete details . . . you'll find them both interesting and helpful.

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THE OSGOOD CO. THE GENERAL CO.

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DIESEL, GASOLINE OR ELECTRIC POWERED • % TO 2½ CU. YD. • CRAWLERS & MOBILCRANES



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BODY and HOIST
PERFORMANCE



Write for name of nearest Perfection Distributor
THE PERFECTION STEEL BODY COMPANY
GALION, OHIO



WELDING TORCH — Full handlelength lever of Model W-46 makes it possible to shut off or release gas



with only finger-tip pressure. This new feature is combined with builtin automatic gasaver.—Weldit, Inc., 990 Oakman Blvd., Detroit 6, Mich.

duty Hexteel floor armor is hexagonal-shaped steel grid which is easily embedded in concrete or mastic, over old or new floors, to make solid, level floor. Exposed steel top of mesh, flush with surface, takes shocks and carries brunt of loads. Floorsteel is flexible floor armor of high quality cold-rolled strip steel which comes in standard rolls 47½ in. or 60 in. wide and 25 ft. long. It rolls out like a rug over new or old floor to be resurfaced. In appearance it is similar to mesh used during war by Navy, but is much heavier. —Klemp Co., 6601 S. Melvina Ave., Chicago 38, Ill.



Concrete

VIBRATORS

Gasoline Engine or Electric Motor Driven CONCRETE GRINDERS

OTHER PRODUCTS

FRONT END SHOVELS
for Industrial Tractors

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ASPHALT PLANTS

Portable — Stationary

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White Mfg. Co.

ELKHART

INDIANA



You Should Know Better ...

Owners operators yes, and even casual observers of Huber 3-Wheel Road Rollers in action, never question their performance. They know that throughout the years Huber has jealously preserved a reputation for dependable operation, low maintenance, all-around economy, plus the extra speed, power, and stamina to lick the worst in road jobs. Your best bet is to buy a HUBER.

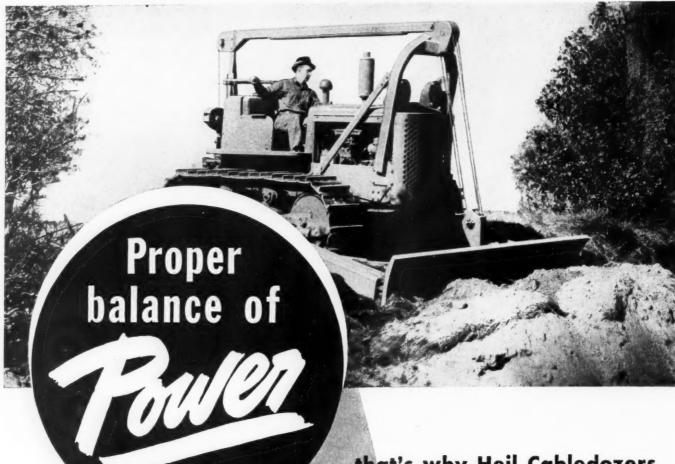
MFG.COMPANY . MARION, OHIO, U. S. A.

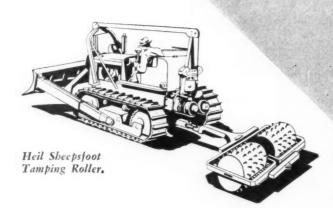
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> 3 Wheel • Tandem





... that's why Heil Cabledozers move more dirt and reduce costs

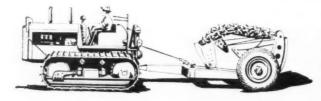
Get in and dig — that's what your tractors have to do if you are going to move dirt economically. They must make full use of their tractive power.

Taking this into account, Heil designed its Cabledozers for International Crawler Tractors so that tractor balance is not disturbed in any way. There is no nosing down or rearing up. Instead, you get full driving and penetrating power at the blade.

That is what Heil calls proper balance of power and — that is why famous Heil Cabledozers cut cleanly, and smoothly, and move more dirt.

Literature describing many other Cabledozer advantages is available. Write for it or see your International Industrial Power distributor,

R-87



Heil 3½ yard, 2-wheel rear-dumping Cable Scraper.

THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1. WISCONSIN

ELECTRIC VULCANIZER — New vulcanizer, for repairing synthetic and natural rubber, applies small and large Electro-Patches, round or oval, and installs rubber-base replacement valves. One downward pull on lever locks Electro-Patch in place under exact pressure needed and one setting of time control turns on electricity for required curing period. Operator can do other work



while Electro-matic "watches" tube repair job. There is no risk of tube scorching. Electromatic timing is variable up to 15 min. Low-voltage transformer assures shock-free operations and bright signal light in plastic case stays on until automatic shut-off breaks circuit. Other features include oil-smooth rocker arm action, automatic wing compensators for varying tube thicknesses, swingdown tube last and rubber pressure cushion that prevents heat transfer and gives upward counter thrust.-J. W. Speaker Corp., Milwaukee 12, Wis.

HYDRAULIC EARTH SCOOP -

Designed for filling in around buildings, terracing, and grading in areas where heavy equipment cannot operate, Scoopmaster carries more than one yard of dirt at a time.



Equipped with hydraulic lift, it is capable of loading, hauling, dumping or spreading without making stop. Cutting blade is designed to be tipped on end so that unit becomes grader when needed to level off and landscape areas around new buildings .- Maquoketa Co., Maquoketa, Iowa.

Curb Forms ... Sections 10' long for either straight face or battered face construction. Steel forms for all special concrete curbs.



Combined Curb and Gutter Forms... Each 10' section consists of leach of back curb form, front gutter form and face curb form, also 2 each of face curb form supports, round stakes for back form and round stakes for gutter form.

Sidewalk Forms . . . 10' sections, slotted 12" for division plates, which are removed without disturbing side forms after concrete takes its initial set.



Rigid Radius Forms... Used for building concrete curbs or curb and gutters when all intersections or corners must match. Heltzel forms made in sets to form a specified radius

Flexible Forms . . . Used when building radius curbs, curb and gutters or sidewalks where the radius is subject to frequent change or for serpentine work in park areas.



Heltzel	Steel	Form	Ł	Iron	Com	pany,	Warren,	Ohio	
	SEN	D ME	ST	EFL I	FORM	CATAL	.06S:		

[] B-19 Steel Highway and Airport Forms

[] B-19A Steel Dual Duty Airport Forms

[] A-20 Steel Forms for Curbs or Curb and Gutters or Sidewalks.

Name.

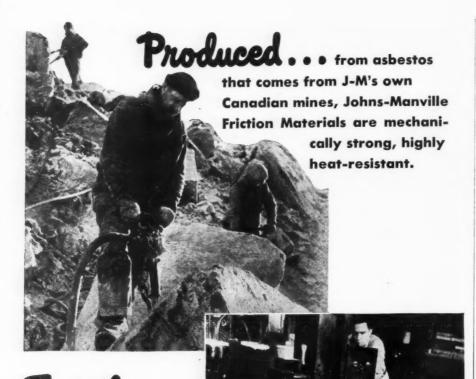
Address_

(Type of construction usually engaged in)

STEEL FORM & IRON CO. WARREN, OHIO . U. S. A.



BINS, Portable and Stationary CEMENT BINS, Portable and Stationary CENTRAL MIXING PLANTS BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale) BITUMINOUS PAVING FORMS ROAD FORMS (with lip curb and integral curb attachments) CURB FORMS CURB AND GUTTER FORMS SIDEWALK FORMS SEWER AND TUNNEL FORMS CONCRETE BUCKETS SUBGRADE TESTERS SUBGRADE PLANERS TOOL BOXES FINISHING TOOLS FOR CON CRETE ROADS



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Laboratories under
actual field conditions.

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FROM raw material to finished product, Johns-Manville controls the quality of J-M Industrial Friction Materials. That's why the highly trained buyers of most leading industrial equipment manufacturers have *standardized* on "Johns-Manville."

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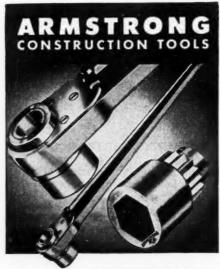
INDUSTRIAL FRICTION MATERIALS

No. I With Leading Manufacturers

PACKAGED POWER UNIT-New and revolutionary type of packaged power unit, to be known as Electrofluid Drive, is available up to 20 hp. This neat, compact, motorized hydraulic combination consists of general-purpose a.c. induction motor flange-mounted on sturdy housing containing hydraulic coupling, also called fluid coupling. Its output shaft may be direct connnected to driven machine or to speed reducer unit or to driven machine through medium of chain, gear or belt drives. Size of motor is based on running horsepower, not on starting requirements. Many advantages are claimed for this power unit which has numerous uses in connection with compressors, conveyors and varied construction operations.-Link-Belt Co., 307 North Michigan Ave., Chicago 1, Ill.

OFFSET JOINTS—Standard line of offset joints fills need for standard flexible unit for joining pipe terminals that are out of line or offset. Joint is constructed with equal number of expansion flanges on either end of insert section. Length of unit and number of flanges are determined by misalignment condition to be corrected. Offset joints are supplied with bellows flanges from any of Magni-

(Continued on page 140)



ARMSTRONG DROP FORGED CONSTRUCTION RATCHETS

The ARMSTRONG Reversible Ratchet Construction Wrenches are made of steel thruout—the Ratchets are drop forged, the Nut Socket machined from special analysis bar steel. All parts except the handle are hardened. The spindle of the Ratchet is of "wide open" design—permits bolt to pass thru the Ratchet so that nuts can be run any distance along bolt and securely set with one setting. 24" or 36" Ratchets take square or hexagonal sockets for nuts of from 1" to 25% dia. or 1%" dia., respectively.

Write for Catalog





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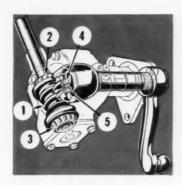
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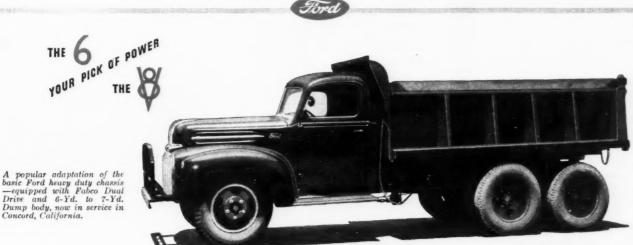
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ORD TRUCKS AST LONGER!

ONE big reason— FORD STEERING STANDS UP!

Ford worm-and-roller steering gear reduces rubbing friction to a minimum. Rolling contact is employed to reduce friction at five vital points. This spares muscle and saves wear. The worm gear (1) is straddle-mounted on two large, opposed, tapered roller bearings (2 and 3). The worm acts upon an easy-turning roller instead of a common sliding cam or split-nut, and this roller is mounted on two needle-type roller bearings (4 and 5). Bearings of both the worm and the sector shafts may be adjusted, thus promoting long life and proper action with less replacing of parts.





ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the V-8 or the

Six-semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (3/4-floating in half ton units, full-floating in all others)—heavy channel section frames, doubled between springs in heavy duty models-big, easy-action brakes, with heavy, cast drum surfaces, non-warping and score-resistant

-extra-thick sheet metal in cabs, cowls, skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering.

That's why FORD TRUCKS LAST LONGER . . . why, as the national truck count for 1946 just released shows, more than half of all Ford Trucks in use are at least 9 years old . . . why there are more Ford Trucks in service now than ever before in history. More than 100 body-chassis combinations to choose from. Ask your Ford Dealer.

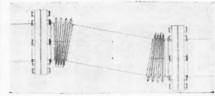
MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE



LUBRIPLATE Lubricants actually condition bearing surfaces and stop progressive wear. They prevent rust and corrosion and resist steam, hot water, many acids and other adverse conditions. LUBRIPLATE is in a class by itself. Use it and make one bearing outlive two. Write or phone for facts and figures.



(Continued from page 138)



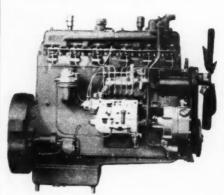
Lastic standard expansion joint series, which includes pressures from vacuum to 1000 psi, pipe sizes from ½ to 24 in., and temperatures from minus 300 to plus 1,600 deg. F. Joints of stainless steel, Monel, Inconel and copper cover all common corrosive conditions. End fittings are available in welding end or Van Stone bolted flanges. — Magni-Lastic Division, Cook Electric Co., 2700 Southport, Chicago 14, Ill.

PHOTOELECTRIC COUNTER -

Photoswitch photoelectric counter Type P1 provides accurate answer to all counting problems. It consists of photoelectric control, light source, and electric counter. Only equipment which needs to be located at point-of-count is control and light source. One or more electric counters (containing counter face and reset knob) may be placed at any convenient location and wired to control. Remote control is thus easily obtained.—

Photoswitch, Inc., 7 Broadway, Cambridge 42, Mass.

DIESEL ENGINE—New line of engines includes four sizes. Model 6-WAKD is 1,197-cu. in. six-cylinder industrial engine applicable to 2-yd. shovels, draglines, hoists, mixers, crushers and similar equipment, re-



quiring from 180 to 225 hp. Other models are 248-cu. in. tractor and industrial six and automatic six of 779-cu. in. displacement. Later, 134-cu. in. four and 201-cu. in. industrial six will be offered. Hardened crankshafts are treated by special process to give greater endurance, long life and running smoothness. Principal dimensions and performance curves are given in bulletin.—Waukesha Motor Co., Waukesha, Wis.

Built to *Hold Tight...*Make Hose *Last Longer*



"KING" COMBINATION NIPPLE

With Patented "Cor-O-Zig"

Corrugations

Malleable iron or brass. Made to fit straight end hose. Two-way "Cor-O-Zig" corrugations permit easier insertion in hose and assure tighter grip under clamp pressure. Sizes 1/2" to 8", inclusive.



"KING" SHANK COUPLING

For Suction and Water Hose

Durable, convenient, economical. Made in three styles—all mallcable iron; mallcable iron, brass nut; all brass. Uniform in quality, threading and dimensions. Sizes 11/4" to 8", inclusive.



"KING" HOSE CLAMPS Single and Double Bolt

Made of malleable iron. Easy to attach, and can be used over and over again. Tightening provides evenly distributed pressure around entire hose circumference. Double bolt style has quadruple take-up. Full range of sizes.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods

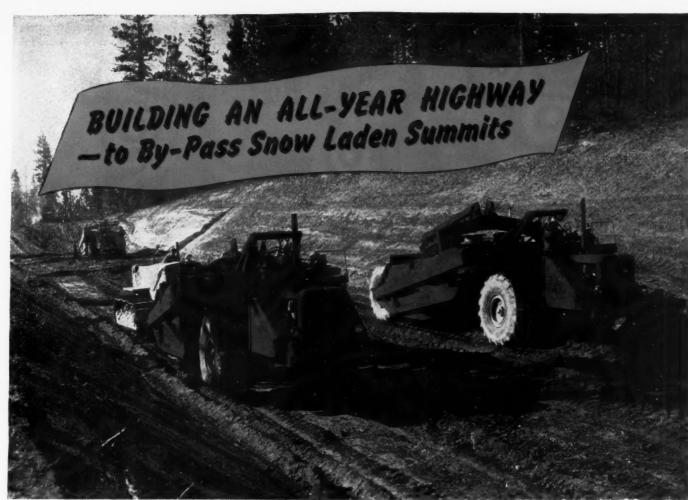
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Chiloquin, Oregon, Job of R. A. Heintz Construction Company, Portland, Oregon

-with a fleet of Wooldridge Terra-Cobras



WOOLDRIDGE TERRA-COBRAS employ the same Bowl features as Wooldridge "Terra-Clipper" tractor-drawn Scrapers

Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

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- * BULLDOZERS
- EARTHMOVERS
- * TRAILBUILDERS
- * Tractor-drawn
- * RIPPERS
- **SCRAPERS**
- * POWER CONTROLS

Working on a 7.5 mile stretch of a new 40 mile highway, which will by-pass the crooked snowy Sun Mountain grade, just North of Fort Klamath, Oregon, Wooldridge Terra-Cobras are handling full loads of volcanic boulders, decomposed lava and cinder soil on an 8 minute round-trip cycle, over a distance of 6400 feet. 40 to 60 seconds loading and 30 seconds spreading in distances up to 100 feet contribute to consistent and continuous speed of haul—down and back a 3% grade. Ample traction and power plus positive two-wheel steering insures sure-footed travel at maximum speed every inch of the way. Flexibility of travel and effortless control saves equipment and operator fatigue. To figure on lower yardage costs, figure on using Wooldridge Terra-Cobras. Investigate fully today.

WOOLDRIDGE



HIGH SPEED-SELF PROPELLED

EARTHMOVERS

WOOLDRIDGE MANUFACTURING CO. SUNNYVALE. CALIFORNIA NATIONWIDE SERVICE



Bethlehem Bar Mats awaiting placement. Though less than a mile in length, this job called for approximately 52,000 sq yd of mats.

Showing ease with which two men can handle Bethlehem Bar Mats Note heavy vehicular traffic along original highway at right.

A detail of the job being discussed by, left to right: D. Pettigrew, Resident Engineer, and Thomas Farley and Joseph Bingham, Inspectors, all of the New Jersey State Highway Department.

Shown holding blueprint, Royal E. Cleveland,

There's good reason for widening the world's busiest highway—New Jersey's Route 25, in the vicinity of Newark Airport—from four to eight lanes. Originally designed to whisk cars to and from New York at the rate of 36,000 per day, this all-important traffic route has long been carrying an average of 60,000 cars daily, with occasional 24-hour holiday traffic topping the 100,000 mark.

These pictures were taken recently along the 0.85 mile Section 32Å, one of two sections built for the New Jersey State Highway Department by Robert W. Cleveland Company, East Orange, N. J. Bar mats, dowels and cable guard rail were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

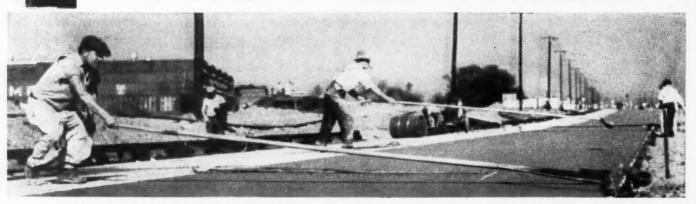
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Leading Bethlehem Highway Products

Road Joints • Reinforcing Bars • Bar Mats Guard Rail • Guard Rail Posts and Brackets Wire Rope and Strand • Hollow Drill Steel Fabricated Structural Steel • Sheet and H-Piling Spikes • Bolts and Nuts Timber Bridge Hardware • Tie-Rods



STEEL for HIGHWAYS



Smoothing operation prior to final brushing. Highway engineers estimate that by 1950, Route 25 may carry close to 75,000 cars daily.



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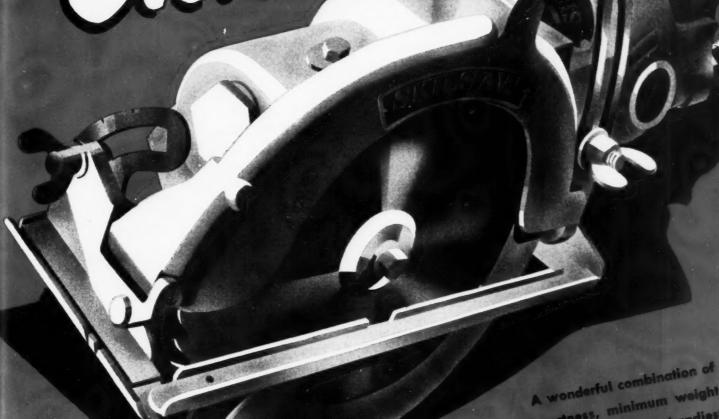




Saw with the saw that's easy to use in any position

DON'T JUST SAW IT ...

Sachall



perfect balance, compactness, minimum weight and ample power makes SKILSAW the handless saw you can own. It's the result of a quarter century of pionoering in the portable saw field. Ask your distributor today about a demonstration.

SKILSAW, INC. 5023 Elston Ave., Chicago 30, III. Fectory Branches in Principal Cities

Cut Engine Trouble, Wear Breakdowns, Teardowns--





Engineered for efficient adequate, economical filtration of lubricating oil on practically any type of Diesel, gasoline or gas engine.

Fram heavy-duty lube filters romove dust, dirt, grit, sludge and abrasives from oil, minimize wear, cut breakdowns. Thus, Fram saves overhauls, repairs and costly delays—lengthens the life of engines.



Made in two sizes to service all types of Diesel engines. May be used individually or in multiple to meet any desired capacity. Scientifically designed, guaranteed to remove all solid particles from fuel.

Fram Filcron Fuel Oil Filters contain the amazing Fram Filcron cartridge, which proved itself an outstandingly efficient filtering agent in widespread Army and Navy use during the war. Made up of stacked cellulose discs, the Filcron cartridge removes particles as small as one micron (.000039 of an inch) in size . . . thus provides absolutely clean oil to injectors, saving maintenance and money.

For information on Fram Lube or Fuel Oil Filters, write: Fram Corporation, Providence 16, R. I. In Canada: J. C. Adams Co., Ltd., Toronto, Ontario.

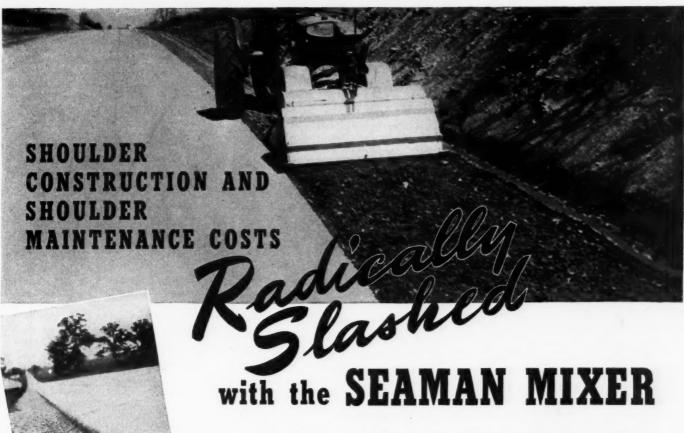




FRAM

OIL AND MOTOR CLEANER

Cleans the Oil that Cleans the Motor



Shoulder stabilization is highly profitable in terms of lower maintenance costs and in greater traffic safety. With the SEAMAN MIXER, the initial stabilization costs can generally be cut as much as 40% in comparison to former methods, — for in most cases, — the aggregate already present in existing shoulders is entirely suitable for stabilization with oil, cement or other binders without trenching out or bringing in a single yard of borrowed material . . . For example, in an eastern state, the Highway Department formerly kept 40 motor patrols busy on shoulder maintenance alone. Following every severe rain, scores of truckloads of gravel were required to replenish material which had washed away and what's more, drains and catch basins were plugged in the process...Shoulder stabilization with SEAMAN MIXERS proved to be the answer. The SEAMANS loosened the in-place aggregate to the required depth and in the same operation,

started the mix... Total cost of scarifying, shaping and mixing was 5 cents per yard. So for similar low-cost shoulder stabilization,—do it with a SEAMAN.

STABILIZATION METHODS

Shoulder stabilization will prevent slab deterioration, traffic hazards and erosion such as occurred here SEAMAN MOTORS, Inc.

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keep right on coming
in for this handy, practical book,
"Soil Stabilization Methods"—
compiled by Seaman engineers.
Have you sent for your copy?
Ask for Bulletin C-25.

THIS PAMPHLET ON oncrete Vibration



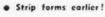
. For it features the latest developments and upto-the-minute information on the newest machines for concrete vibration . . . also attachments for finishing.

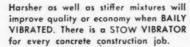
It will be a valuable addition to any technical literature file that every contractor should have. The equipment featured is the combined development of STOW, the inventor of the flexible shaft principle with 70 years' experience in flexible shaft manufacture, and BAILY, the pioneer of concrete

Write for your free copy today, without delay!

Quality can be improved, costs can be cut.... with the STOW VIBRATOR

- Eliminate voids and honeycombs!
- · Place concrete of low Water-Cement Ratio!
- Get High Density and Greater Bond to reinforcement!





VIBRATOR ST

MANUFACTURING CO.

31 Shear St., Binghamton, New York

HEAVY-DUTY HELPS TO SUPPLY AIR FOR C&O RY. **BLUE RIDGE** TUNNEL JOB!

This single cylinder heavy-duty Wisconsin Air-Cooled Engine is operating a H-42-DG, Type 30 Ingersoll-Rand Air Compressor which furnishes starting air for the XVO Compressor Unit on the C & O Railroad's Blue Ridge Tunnel Job, near Afton, Virginia . . . handled by contractors Bates & Rogers, Chicago.

This is just another run-of-the-mill Wisconsin Air-Cooled Engine construction service application . . . typical of the

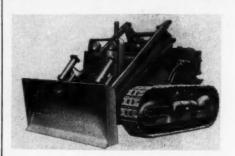
many heavy-duty power jobs entrusted to these tough, hard-hitting engines on a great variety of equipment in many fields, Wisconsin Air-Cooled Engines are supplied in 4-cycle single cylinder and 4-cylinder V-type models in a power range of 2 to 30 hp.

Specify "WISCONSIN" for utmost dependability and heavy-duty serviceability.

WISCONSIN MOTOR Corporation MILWAUKEE 14, WISCONSIN

World's Largest Builders of Heavy Duty Air-Cooled Engines

BULLDOZER-SHOVEL-Model 9-A bulldozer-shovel, built into International T-9 and TD-9 TracTractor, is dual-purpose unit and may be equipped with either full-track width 1-yd. bucket or bulldozer blade. Bucket is raised, lowered, dumped and relatched entirely by hydraulic control, eliminating practically all physical effort. Bucket tilts back



automatically in carrying position preventing spillage. Overhead and side structures are eliminated, contributing to full 360-deg. visibility while digging, carrying or dumping, as well as assuring better balance and stability, with reduced wear on front track rollers and idlers. Long, high dumping reach is provided for dumping into trucks, hoppers, etc. Unique design of pusharms provides powerful crowding action in digging range and fast hoisting action thereafter. Catalog No. 164 gives mechanical details and specifications.-Frank G. Hough Co., Libertyville, Ill.

PNEUMATIC TIRE — Substituting high tensile steel wire for cotton and rayon cord, Wire Cord tire, is considered ideal for use in logging, mining, quarrying or construction industries. Tire runs cooler under heavy loads at high speeds. It has never been known to blow out, gives greatly increased mileage and, be-



cause of its great body strength, can be recapped several times. Wire Cord is built up of plies of rubberized wire cord in same manner as conventional cotton or rayon cord. Because of greater strength of wire cord, fewer plies are required than with cotton or rayon. Wire cord is .036 in. dia. It is composed of several strands of wire .0058 in. dia. twisted together.-Firestone Tire & Rubber Co., Akron, Ohio.

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REASONS WH

Wendling Bros. Co., General Contractors, Dover, Ohio, are enthusiastic about their MICHIGAN Mobile SHOVEL-CRANE



SPEED AND ECONOMY: "... average daily fuel consumption is 20 gallons of gasoline ... 600 yards of material loaded or unloaded per day and with clam we can excavate average of 400 yards per day. With trench hoe, 500 to 700 feet of of trench can be opened, depending on depth of ditch."

OPERATING EASE: " . . . Air Controls make this machine one of the easiest to operate."

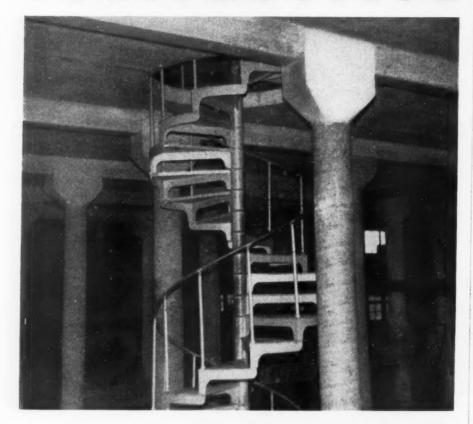
TRUCK MOBILITY: " . . . Because of the ease with which MICHIGAN can be moved, we have worked on 5 different jobs in one day due to the fact that it can travel 30 to 35 miles per hour over the highway."

VERSATILITY: "We have used this machine for pile driving, dredging creeks, bridge building, setting steel, loading strip steel in 5 to 10 ton bundles and in one instance lifting a piano and putting it into an upstairs window."

Wherever you go, you'll find long-time owners lavish in their praise of the ability of MICHIGAN Mobile SHOVELS-CRANES to do more work in less time, at less cost . . . Complete details on these 3/8 yd. and 1/2 yd. fully convertible MICHIGAN Mobile SHOVELS-CRANES is yours on request. Ask for Bulletin CM-37.



Sonotube CONSTRUCTION



a neat, practical, clean-cut job for less money

SONOTUBES used to form the supporting columns with reinforced caps, carrying 12"

I beams for 8" reinforced concrete floors.

SONOTUBE is the practical laminated fibre tubing used for forming concrete columns and piers.

IMMEDIATE DELIVERY



		-INSIDE	DIAMETER		
8"	9"	10"	111/4"	12"	131/2"
		SQUARE	INCHES		
50.26	64	78.54	100	113.1	144

SMALLER SIZES AVAILABLE

LENGTHS UP TO 24'-WRITE FOR DELIVERED PRICES

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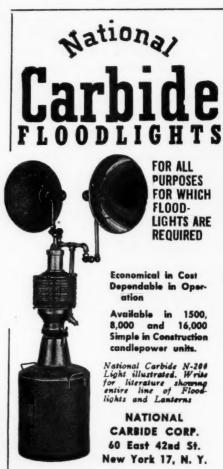
HARTSVILLE, S. C.

MYSTIC, CONN.

ROCKINGHAM, N. C. GARWOOD, N. J. LOWELL, MASS

AUGER BIT SET—This set consists of 8¼-in. shank and number of quick-change boring heads, packed in rigid two-color plastic case. It comes in two sets. One set contains six boring heads, % in. to 1¼ in. by eighths. Second set contains eleven boring heads covering range from % in. to 1¼ in. by sixteenths. Both sets are available with straight shanks for use in bench drill, drill press or portable drill, or with square shanks for use in hand brace.—Bruno Tools, Beverly Hills, Calif.

WELDER'S GOGGLES - Speedframe eliminates waste motion and time of hand adjustment of goggles. Nod of head raises or lowers them instantly. Speedframe consists of suitable goggles mounted in lightweight fiber headframe of headline design which holds goggles securely in either position without uncomfortable pressure on temples or bridge of nose. It is made fully adjustable in three directions by side and top straps and is held in desired position by a simple screw-type clamp. It can be furnished with welders' or chippers' goggles, with or without Coverglas lenses.—Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8. Pa.



POWERFUL AS A

giant

WITH BARCO

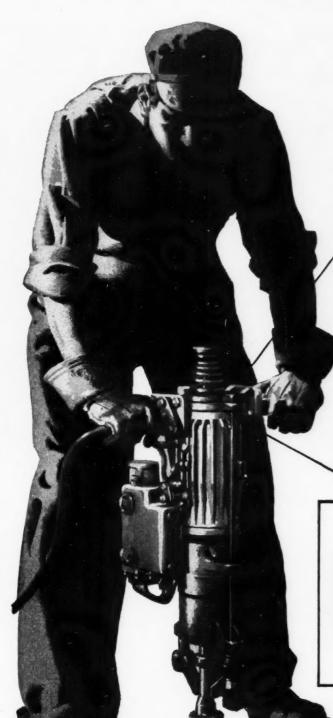
On construction, repair, demolition and expansion projects, big or small—the compact, portable Barco Gasoline Hammer is the favorite speeder-upper. Even a slight, small worker has tremendous strength in his arms when he uses a Barco Hammer. This rugged tool hits hard and fast under rugged conditions and in hard-to-reach spots-gets the tough jobs done in record time-cuts costs. Eleven special tool attachments.

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A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION

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WIRE ROPE SALES OFFICE AND PLANT - Palmer, Mass.

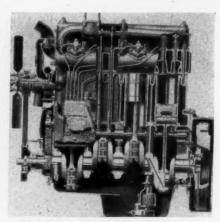
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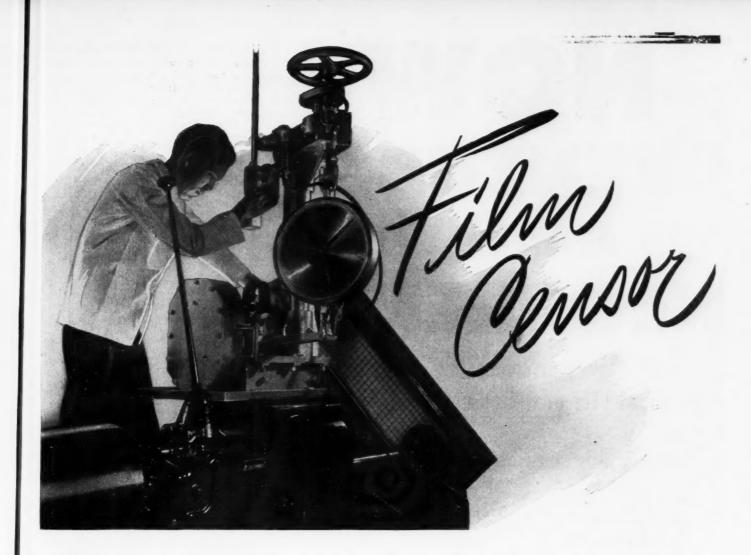
PACIFIC COAST:—The California Wire Cloth Corp., Oakland 6, Cal.

DIESEL POWER UNITS—Start of production on 125-hp. Model UD-18A power unit and 76-hp. Model UD-14A was recently announced. Both are heavy-duty four-cycle diesels with same bore and stroke. UD-18A has six 4%x6½-in. cylinders and UD-14A has four. New cylinder head arrangement, improved noz-



zles, and redesigned precombustion chambers give them higher compression and greater efficiency in converting fuel energy into low-cost power. Exhaust manifold is on injection side of engine, away from intake manifold, so incoming air is kept cooler. Both units achieve their higher rpm. and increased horsepower without resort to special lubricating oils.—Industrial Power Division, International Harvester Co., 180 N. Michigan Ave., Chicago

SHIELDED ARC ELECTRODES-New electrode has been developed to produce machinable welds on cast iron. After machining or grinding, weld metal deposit closely matches color of cast iron parent metal. Special nickel core wire, which has nickel content of more than 99 percent, has coating which is free of fluorides and other ingredients that generate injurious gases. Ni-Cast shielded arc electrodes have quiet stable arc free from spatter with minimum of penetration and heating of cast iron. Weld metal deposit will be sound, homogeneous and free from porosity on all grades of cast iron, while fusion zone of casting will be free from hard zones of white iron. Weld metal will be free from cracks or cross checks when multiple passes are used in repair or fabrication of cast iron parts. Welds are also free of leaks on casting subject to hydrostatic pressures without using any special welding techniques or processes. Deposit and fusion zone of cast iron may be easily machined, ground or filed. They are manufactured in 3/32-, 1/8-, 5/32and 3/16-in. diameters and packed in 10-lb. cartons:-Page Steel & Wire Division, American Chain & Cable Co., Inc., Monessen, Pa.



The alert technician in the illustration is censoring film—the strength of film in Sinclair industrial lubricants designed for protection of your valuable machinery.

These tests prove that Sinclair lubricants have the film strength to keep moving metal parts separated under extreme temperature and pressure conditions. With the SAE film strength test machine, skilled laboratory technicians check constantly, reject substandard product, assure you of essential protection.

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Every batch of lubricant in process gets an equally careful check for other all-important qualities. Constant research by Sinclair assures you of the benefits of new developments in film strength...and in all other prime lubricant qualities.

Sinclair Automotive Lubricants

For Engines:

OPALINE MOTOR OIL
OPALINE TBT MOTOR OIL

(For severe service)

TENOL (Heavy Duty — For Diesels)

For Gears:

OPALINE GEAR LUBRICANTS

For Chassis:

OPALINE CHASSIS LUBRICANT

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SINCLAIR REFINING COMPANY . 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH

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NOW "VENTUBE" IS MADE WITH NEOPRENE...

Tough, durable neoprene coating makes flexible ventilating duct even better than prewar type!



- LIGHTER IN WEIGHT
- MORE FLEXIBILITY
- EASIER TO COUPLE
- STANDS UP TO ACID
- RESISTS HEAT, AGING

We're glad we can now give you more value in your "Ventube"* than ever before—with tough, durable neoprene, the Du Pont synthetic rubber that gives such unusual service in conveyor belts, cable-jacketing and other equipment. "Ventube" is now coated with neoprene, and the "Ventube" fabric is thoroughly impregnated with a neoprene composition engineered to give long life and trouble-free service.

Many advantages of the new material: (1) Much more flexible for carrying air around curves and corners, for coupling and uncoupling; (2) Much lighter in weight, for lifting and carrying long lengths, and

(3) Neoprene is long-lasting, withstands corrosive acid or alkali waters, resists oxidation from heat and aging. Not only better than wartime types, but even better than prewar "Ventube."

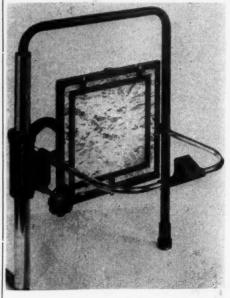
And remember that regular "Ventube," attached to a motor-driven blower fan of adequate capacity, delivers fresh air to men at work and that bad air and dust can be drawn off by the use of helical-type "Ventube" attached to a motor-driven exhaust fan. "Ventube" keeps temperatures low enough for efficiency, reduces down-time after tunnel blasting, speeds production in many ways, cuts accidents. It is easy to install, to move, to store. Low in both original and upkeep cost.

For further details, consult Du Pont Technical Service, Fabrics Division, E. I. du Pont de Nemours & Co. (Inc.), Fairfield, Conn.

*"Ventube" is Du Pont's registered trademark for its flexible, synthetic-rubberized ventilating duct.



MAPPING INSTRUMENT—Rectoplanigraph provides map-maker with simple means of rectifying and transferring planimetric detail from aerial photographs to maps and charts. It is portable, lightweight instrument, easily assembled and disassembled, which can be set on drafting table.

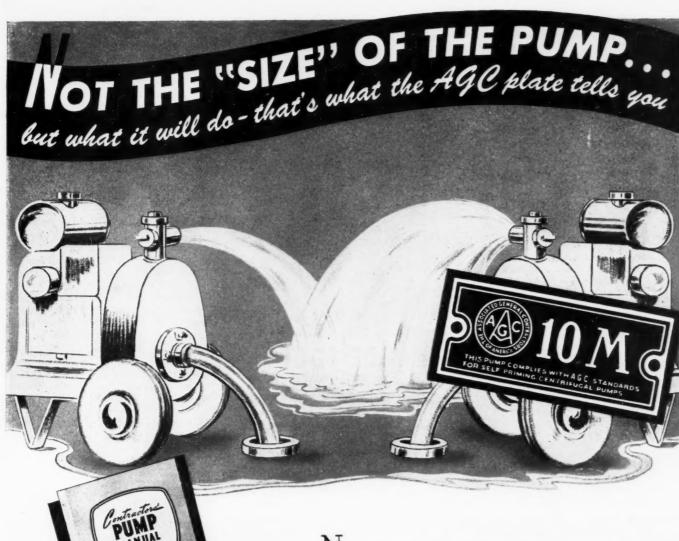


Its design provides indexed adjustments for three focal lengths (6, 8¼ and 12 in.), micrometer adjustment for all variations in scale, and (Continued on page 154)



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Be sure you get your copy of this Users' Pump Manual, prepared by the Contractors Pump Bureau. Contact your distributor or write any of the Companies listed below.

Nor the size of the pump, but what it will do is the only way to rate a pump. And an AGC rating carried on the pump tells its capacity at a glance—tells accurately and fairly what it will do.

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C. H. & E. MANUFACTURING CO. Milwaukee, Wis. (ESTABLISHED 1938)
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THE ASSOCIATED GENERAL CONTRACTORS
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CONSTRUCTION MACHINERY CO. Waterloo, lowa MARLOW PUMPS Ridgewood, N. J.

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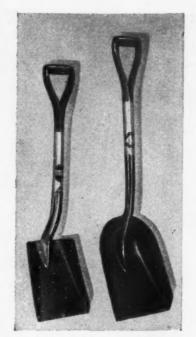
STERLING MACHINERY CORP.
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THE GORMAN-RUPP COMPANY Mansfield, Ohio

> NOVO ENGINE CO. Lansing, Mich.





BLADE EDGES

The Borg-Warner Line

Write for Catalog and Prices
INGERSOLL STEEL DIVISION
BORG-WARNER CORPORATION
New Castle, Indiana
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazee, Mich

(Continued from page 152)

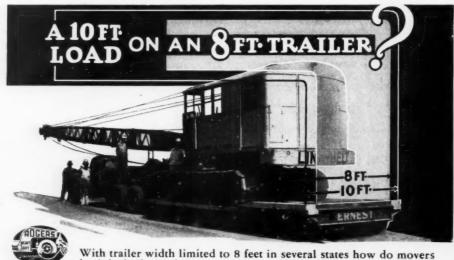
other adjustments for rectification of photographs to compensate for errors introduced by tip and tilt. Picture-holder is fitted with masks to accommodate air-photos ranging from 4x5 to 9x9 in. High quality prism, used instead of half-silvered mirrors found in other equipment, assures sharp, well-illuminated image.—Fairchild Camera and Instrument Corp., Jamaica, N. Y.

AIR HOSE-Black Wing cord line, water and air hose is built in 34to 21/2-in. sizes. Horizontally braided, exclusive method of bonding cover, carcass and tube together gives hose rope-like flexibility and yet retains maximum ruggedness. Black Wing air hose is manufactured in two types -two-braid standard for pneumatic tool service and three-braid heavyduty for air drill usage. Sizes range from 1/8 to 11/2 in. Both products utilize cabled cotton body for greater carcass strength and sturdy, seamless tube unaffected by lubricants which often cause swelling and and flaking.-Goodyear Tire & Rubber Co., Mechanical Goods Division, Akron, Ohio.

SCOOPMOBILE - New Model B Scoopmobile incorporates several outstanding new improvements. It is tricycle-type materials handling machine. Complete bucket control is accomplished by two hand levers controlling entirely new pick-up, hoisting and discharging mechanism. Operator can pick up full load from



stock pile without shock loading. Design of bucket has been changed to eliminate spillage over rough terrain and partial loads can be discharged as bucket can be placed in any angle and closed at any time during discharge operation. Digging angle can now be controlled without lowering bucket to ground. Standard Scoopmobile weighs approximately 5,300 lb. and overall length is only 14 ft. Turning radius is only 9 ft.-Mixermobile Manufacturers, 6853 N. E. Halsey St., Portland 15, Ore.



haul the bulky loads in excess of this width?

Many of then have solved the problem with Rogers Trailers equipped with swinging side brackets which quickly widen the trailer to 10 feet. Authorities permit these necessary moves knowing that the return trip will be made with the trailer again narrowed to legal width.

Solutions to other unusual problems are to be found in Rogers Girder Type and Rocking Beam Trailers.

Write for the Rogers Catalog.

ROGERS BROTHERS CORPORATION

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EXPERIENCE builds em · PERFORMANCE

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Remember

A TRUCK THAT FITS THE JOB **LASTS LONGER**

TT STANDS to reason that a truck will last longer and will operate more economically-when it's powered with an engine "sized" for the job.

When you buy a Dodge "Job-Rated" truck, for instance, you get not one of two or three engines—

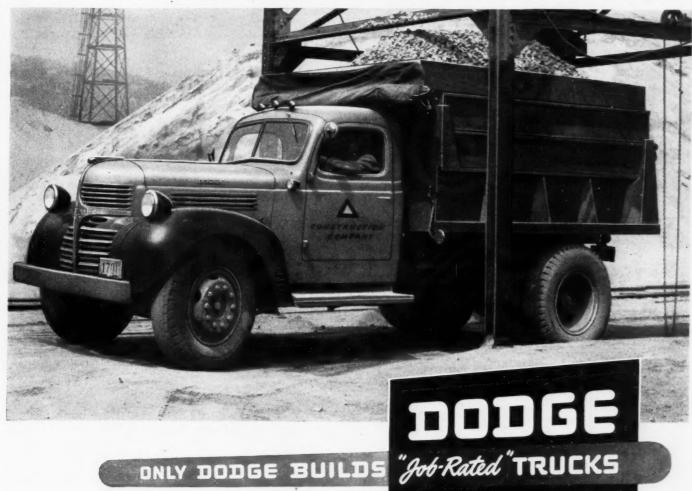
but the right one of 7 different engines—the one "Job-Rated" to handle your jobs most efficiently and economically.

You get the right unit in every other part of the truck, too-the right one of 5 clutches, of 4 transmissions, of 18 rear axles—the right brakes.

Dodge can give you a truck that will fit your job -because Dodge builds a range of 175 different "Job-Rated" chassis models.

So if you want a truck "Job-Rated" for longer life, greater economy, and maximum dependabilityhauling your loads over your roads—see your Dodge dealer for a truck to fit your job. And remember . . . only Dodge builds "Job-Rated" trucks!

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Fit the Job . . . Last Longer!



Mall Gasoline Engine Vibrator is fast-easy-and economical. .. lajo a oun .. mix in less time than any other vibrator of the same size . . . eliminates honeycombs and voids . . . increases bonding strength. Variable Speed Gasoline

Engine operates 8 other interchangeable construction tools. A size and type available for every job—powered by $1\frac{1}{2}$ or 3 H.P. Gasoline Engine, $1\frac{1}{2}$ H.P. Universal Electric or 7500 r.p.m. Pneumatic Units.

Ask your Distributor or write for literature and prices. CONTRACTORS' EQUIPMENT DIVISION

MALL TOOL COMPANY, 7757 South Chicago Avenue, Chicago 19, III. See our advertisement in The Saturday Evening Post-April 5 issue.

Offices in **Principal Cities**



You Can't Beat Welded Construction Williams 74pe BUCKETS Wellman pioneered welded rolled steel construction for longer life and greater service. It's the extra strength that gives the extra, low-cost digging power. Whatever your requirements . . . whether for Multiple Rope, Power Arm, Dragline, Power Wheel or Special Service-specify Wellmanl 3/8 to 161/2 yd. capacity. SEND FOR BULLETIN THE WELLMAN ENGINEERING CO. 7017 CENTRAL AVENUE . CLEVELAND 4, OHIO

TESTING SCREEN - Mechanical testing screen is designed for efficient sizing of test samples of crushed stone, gravel, slag, and similar materials. It handles up to 1 cu. ft. of sample, making from two to seven separations simultaneously. Screen action is so adjusted, it is claimed, that separation approaches theoretical refusal point very closely even



when samples contain elongated fragments and materials varying in density. Very fine materials can also be handled efficiently and screen has been found useful for concrete research and other special applications where extremely close sizing is desirable. Also recently perfected is sand attachment which uses standard 8-in.-dia. testing sieves in conjunction with vibrating unit. Characteristic screen action is efficient over entire size range from 4-in. to 200-mesh.—Gilson Screen Co., P. O. Box No. 186, Mercer, Pa.

MASONRY WATERPROOFING -

Guaranteed masonry waterproofing that decorates and seals out moisture in one simple operation is known as Celadri. This compound costs no more than good grade of ordinary paint, yet will completely waterproof concrete, brick, stone, stucco and all porous masonry surfaces, inside or outside and above or below ground. It is easily applied, completely odorless and quick drying (6 to 24 hr.) It does not peel or rub off, but hardens to rock-like consistency that will last life of any surface except floors. It is available in snow white, buff, light grey, blue, green and terra cotta. — Celadri Corp., 644 Willis Ave., Williston Park, N. Y. anical icient ushed r maft. of seven creen imed, oretieven

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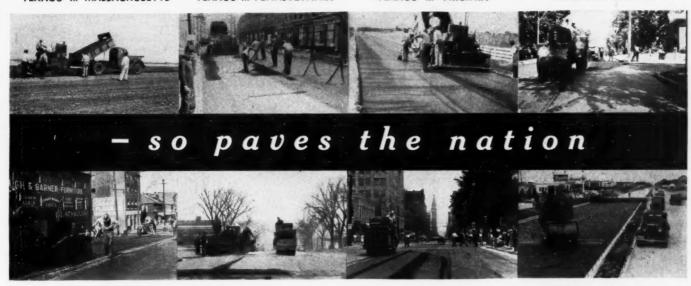
Laying 31/2 miles of twocourse Texaco Asphaltic Concrete pavement through the center of Bangor, Me.

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Last year, when Bangor, Me., needed 3½ miles of new paving through the heart of the city, the type of construction used was resilient, heavy-duty Texaco Asphaltic Concrete.

"As Maine goes, so goes the nation" might well be paraphrased "As Maine paves, so paves the nation." Throughout the country for 40 years, Texaco Asphalt paving has been winning increasing popularity among road builders for heavily traveled streets and highways.

Texaco Asphalt products are refined only from carefully selected crudes. They include a wide range of Asphalt Cements, Cutback Asphalts and Slow-Curing Oils, produced to meet the road builder's most exacting specifications. Whether you require a heavy-duty pavement, a low-cost asphalt surface, a surface-treatment or a dust layer, there is a Texaco Asphaltic product exactly suited to your needs.

Take advantage of the broad, practical experience of Texaco representatives, who are Asphalt specialists. Write our nearest office.



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2

EXACO ASPHALT

You should have these DUFF-NORTON JACKS to Speed Construction Work

AUTOMATIC LOWERING JACKS



Unexcelled in safety, low maintenance and easy operation, these jacks are available in 5, 10, 15, 20 and 25 ton capacities, for a wide variety of uses in construction jobs. Heights from 14" to 2734."

HEAVY DUTY SCREW



For bridge and wrecking work, handling heavy machinery, rigging and other heavy lifting. Made in 15, 25, 35 and 50 ton capacities. Available in sizes to meet the need. Heights from 22" to 27".

JACKS

1

TRENCH BRACES

Duff-Norton trench braces are safe and economical for all trench and excavation jobs. Strong construction and quick installation. Complete with pipe in lengths from 16" to 60"—with extentions of from 6" to 10" according to size.



LOW HEIGHT SCREW JACKS

For bridge building, locomotive shops, ship-yards and heavy construction work. Ideal for use in short heights and cramped areas where high lifting is required. Capacity—50 tons. Heights, 16" and 16½".



PIPE FORCING JACKS

Plumbing contractors, public utility companies, city water and sanitation departments find this double acting ratchet jack unique for laying or removing pipe in places of uneasy access. Capacity—15 tons. Length, 8 feet. Travel of cage, 7 feet.



PUSH AND PULL JACKS

Used by contractors, drillers, riggers, railroads, shipyards and industrial plants. Powerful for pushing apart or pulling together steel plate, sheet, beams, etc. Used with chains, hooks or pipe sleeves for increased range of applications. Capacities—10 to 15 tons. Overall lengths—24" to 38" or longer if desired.



These are just a few of the many types of Duff-Norton Jacks available for every construction requirement. Write today for Catalog 203 which illustrates and describes our complete line.

THE DUFF-NORTON MANUFACTURING CO.

PITTSBURGH, PA.

See your Associated Equipment Distributor

SOIL SAMPLER—For securing undisturbed soil samples in material in which it is difficult or impossible to recover them by open tube method, Cannon "Shurshot" sampler has been designed to get almost watertight shut-off. Special 32-in. long tool is designed to work on end of standard drill and to be driven by small drop hammer on drill stem to depth required. Where it is desired to take sample, drill stem is rotated with wrench to force closing of spring at lower part of unit to hold intact sample.—Cannon Diamond Drilling Co., P. O. Box 549, Compton, Calif.

—Streetlight globes of "Lucite" acrylic resin, tough, transparent plastic, have recently been developed for use in city parks, alleys and secluded areas where vandalism causes high mortality of glass globes. Plastic has excellent light-diffusion properties and combines advantages of glass with additional quality of

PLASTIC STREETLIGHT GLOBES

of glass with additional quality of impact-resistance. Globes are made of four sheet sections of patterned DuPont "Lucite" which are slipped into slots of a metal holder to form the familiar vase-shaped streetlight

enclosure.-E. I. duPont de Nemours

& Co., Arlington, N. J.



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COMPANIES WATERLOO, IOWA

CONSTRUCTION MACHINERY

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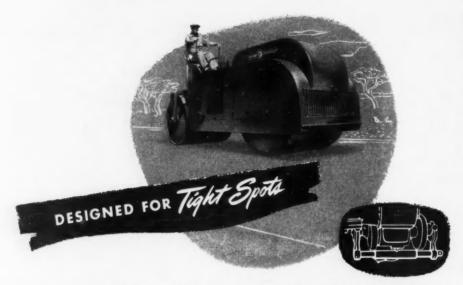
Marlow "Water Wizard" Self-Priming Centrifugals are made in 1½ to 10-inch sizes,

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EQUIPMENT MEN

and Their Companies

Leasing by the International Harvester Co. of a tract of 1,920 acres of land near Phoenix, Ariz., as a site for experimental testing activities of industrial power equipment, has been announced. The land, formerly used by General Motors as a tank testing site, is located approximately 23 mi. from Phoenix. It has been leased for a period of 5 yr. The area will be used as a testing ground for International Harvester's line of industrial power equipment which includes heavy crawler tractors, power units, etc. In addition, several makes of allied industrial equipment used in conjunction with Harvester's line will also be tested.

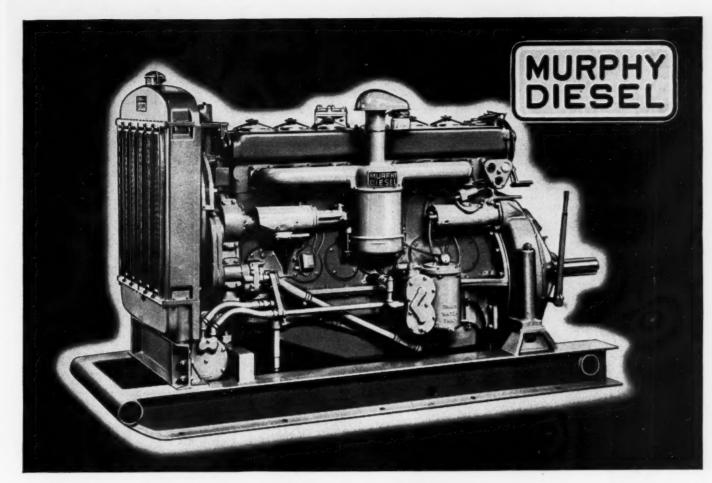


Marion Davis
Caldwell has
been appointed
assistant manager of the contractor's section,
explosives sales
department, of
Atlas Powder
Co., Wilmington,
Del. He will
make his head-

quarters at 3615 Olive St., St. Louis, Mo., and his activities will cover the entire Middle West.

Several appointments to positions in the Wood Preserving Divisions of the Koppers Co., Inc., have been announced by W. F. Munnikhuysen, company vice-president and general manager of the division. Walter P. Arnold, formerly manager of the technical department, becomes assistant to the vice-president in charge of railroad sales; J. M. Irvine, formerly district sales manager in New York, has been appointed assistant to the vice-president in charge of commercial sales; R. H. Bescher has been named manager of the technical department.

Phillip F. Pierce has joined the engine division of the H.O. Penn Machinery Co. His work in selling Caterpillar diesel marine and industrial engines will be principally along the Connecticut and New England coasts. His headquarters are at Newington, Conn. He was formerly manager of the Gloucester branch of Cummins Diesel Engines of New England, Inc.



Model ME-650, 53/4 x 61/2" 6 cylinder Supercharged MURPHY DIESEL Engine, powering a typical crushed stone plant, at Burkesville, Ky.

Get More "Rock Power"

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nge at rly of ew GET a MURPHY DIESEL on the job if you want more rock output. These rugged, heavy-duty engines have the "rock power" you need . . . dependable power that takes hold instantly on the heavy crushing-loads, and handles the long, steady pulls just as willingly . . . at low cost for both operation and maintenance. Specify MURPHY DIESEL power whenever



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500 Lexington, Homer City, Pa.

James H. Markley is general manager of the newly equipped plant and warehouse of the New York Steel & Rock Bit Corp., 1211 Wyatt St., New York 60, N. Y. The shop handles new and reconditioned hollow drill steel, moil points, rethreading, reshanking, etc. Pyrometer controlled furnaces and expert workmanship are available.

To better serve the increasing demand for industrial and commercial heating in the south, Dravo Corp., Pittsburgh, Pa., has opened a new sales office at 305 Techwood Drive, N.W., Atlanta, Ga. Robert A. Hedges has been transferred to manage the office, and will actively represent Dravo in the sale of Dravo Counterflo oil and gas burning direct fired heaters and Dravo crane cab coolers. He will handle sales, through local distributors in Alabama, Georgia, Florida, Louisiana, Mississippi, North and South Carolina, Tennessee and parts of Arkansas and Virginia.

A. C. Roeth, Jr., has been appointed St. Louis district sales manager of the Inland Steel Co. He will succeed P. M. Lorenz.

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H. K. Porter Co., Inc., has announced that it is moving its two Quimby Pump manufacturing operations in New Jersey to be centralized in the company's plant at 49th & Harrison Sts. in Lawrenceville.

New York, have recently been elected vice-presidents. They are: J. D. Yoder, manager of the boiler feedwater division; D. J. Saunders, manager of industrial sales; G. N. Proctor, manager of manufacturing, and H. L. Bechner, who has held the post of technical manager.

The Ideal Development Co., Buffalo, N. Y., has bought 18 slate quarries in Pawlet, Poultney and Wells, Vt., and will manufacture a new line of slate brick and tile developed experimentally in Buffalo. Bricks will be sawed from solid slate for building fronts and other decorative purposes. The tile will be made from quarry refuse. Roofing slate and mill stock will also be produced.

The LaPlant-Choate Manufacturing Co., Cedar Rapids, Iowa, one of the world's largest manufacturers of bulldozers for tractors, is going into the rubber-tire tractor unit field. Last March the firm announced the setup of its distribution system and within four months the firm had distributors in both North and South America. LaPlant-Choate now is dependent upon other firms in other cities during its present stage of manufacture, but it soon expects to sell complete packages. E. R. Galvin, executive vice-president and general sales manager, says that rubber-tire tractors present a new field and adds that the new units will transport dirt faster and cheaper. Tractordrawn units carry 70 yd. of dirt an hour, while the new units will transport 150 yd. an hour.

The Ford Motor Co. will discontinue manufacture of tractors for Harry Ferguson, Inc., on or about June 30. 1947, Henry Ford II, president, announced. It will continue the manufacture of the Ford tractor after that date. Tractors and implements will be distributed through independent distributors and dealers and not through the Ford branches. Frank R. Pierce, a former vice-president of General Motors, has become president of the Dearborn Motors Corp., the newly formed company which will distribute Ford tractors and farm implements. Headquarters for the new corporation will be in Dearborn, Mich.



Band friction clutches allow instant travel direction change smoothly and noiselessly and results in a more satisfactory back and forth ironing motion. Short wheel base permits easy maneuvering in close quarters. Rugged and simple design assures less maintenance. Plate and angle construction welded into a rigid unit. Both models can work close to wall or building to minimize hand finishing. Water tank and spray equipment included.

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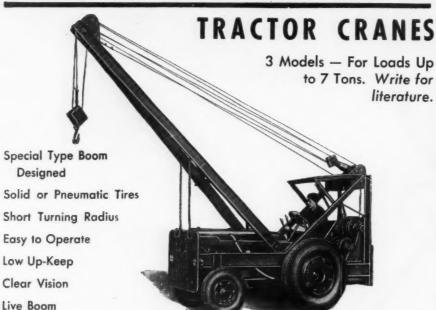
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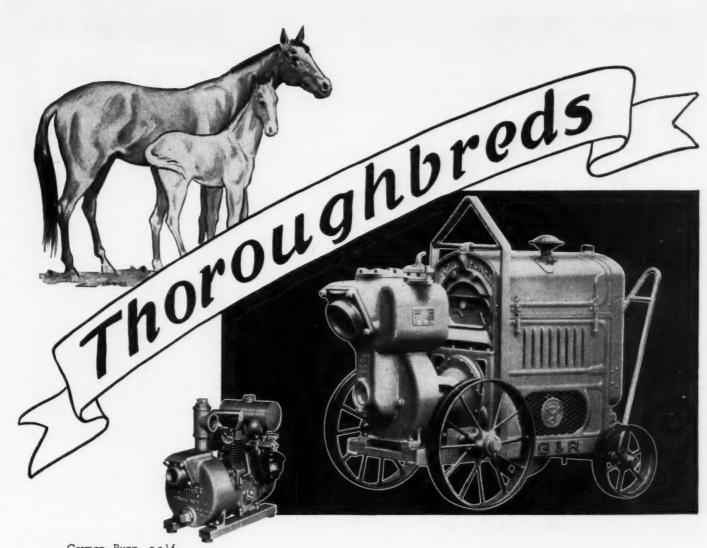
BULLDOZERS AND SNOW-PLOWS — (4-p. folder) Describes parallel blade lift mechanism, which is standard equipment for Trojan bulldozer, V-type snowplows and

reversible one - way snowplows. Specifications are given for bulldozers for use with International industrial wheel type tractors .-Contractors Machinery Co., Batavia,

FABRICATING AND PROCESSING ALUMINUM-"Technical Advisor" is new monthly technical paper devoted to publicizing latest recommendations on how to use aluminum mill products most effectively. Question-and-answer section is dedicated to making available to wider audience answers to many questions sent in to Reynolds technical men. Another feature is technical process studies included serially. Current series is devoted to welding of aluminum, with first issue covering general factors involved, weldability of various aluminum alloys, application of gas welding, and edge preparation for gas welding.-Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

CHLORINATED RUBBER PROD-UCT — (32-p. booklet) Describes Parlon and gives results of longtime exposure tests of this paint base. Parlon finishes discussed are alkyd enamels, finishes for alkaline surfaces, paints resistant to chemicals, varnishes, traffic paints, furniture finishes, marine finishes, and emulsion paints.-Hercules Powder Co., Wilmington, Del.

CEMENT STABILIZER-(4-p. folder) Describes Konset, pozzuolanic cement stabilizer for hydration activation, workability, curing and color.—Sullivan Co., Memphis 2,



Gorman-Rupp self-priming, centrifugal pumps are made in any size or capacity up to 125,000 gallons per hour. The pumps pictured here are: the "Midget" (model 2101) weighing only 60 pounds will pump 3000 GPH at ordinary heads and the model 1602 (90M) with a capacity of 90,000 GPH at ordinary heads.

THE QUALITIES OF STAMINA AND ENDURANCE

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A thoroughbred is never a quitter. Gorman-Rupp selfpriming, centrifugal pumps will handle anything that comes their way for days, weeks, months at a time, if you want them to – and they'll stand up and stay on the job.

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Thirty to sixty days without a stop is common with Gorman-Rupp pumps. You can handle more water per hour for size of pump and with less fuel than any other pump.

We will be glad to place one in your hands and let you be the judge.

Originators in 1936 of the Famous Blue Pump that others now imitate

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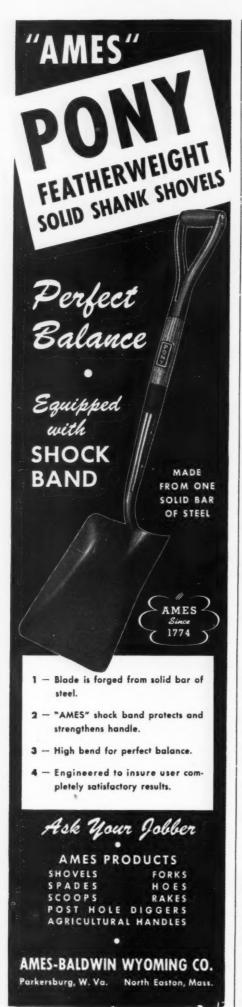
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GORMAN-RUPP COMPANY



WHEEL TRACTOR—(4-p. bulletin) Lists features of Model B wheel tractor with industrial mower, illustrated by action shots, close-up, cutaway photos. Specifications listed in detail.—Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis.



PIPE IN AMERICAN LIFE— (48-p. illustrated booklet) Presents historical background and modern uses of metal pipe, with emphasis on use of steel pipe. Chapters are de-

voted to uses of steel pipe in homes, large buildings, process industries, railroads, shipping, mining, water supply systems, oil industry, gas industry, refrigeration, irrigation and on farms.—American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.

ALUMINUM ALLOYS — (248-p. book) Features the 106 tables of technical data describes briefly history of aluminum, discusses alloy tempers and physical properties, and presents detailed data on chemical, physical and mechanical properties of high purity aluminum. Subsequent chapters take up various mill products, including sheet and plate, extruded shapes; roll formed shapes; tubing and pipe; wire, rod and bar; forging stock; ingot metal; press forgings.—Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

SNOW REMOVAL—(4-p. folder) Highlights attachments which convert motor graders into snow removal units. Attention is focused on V-type snowplow, mast-type snow wing and reversible one-way plow and bulldozer for use with Caterpillar diesel No. 12, No. 112 and No. 212 motor graders. Basic specifications are given and principal features of attachments are treated editorially and pictorially.—Caterpillar Tractor Co., Peoria 8, III.

ASPHALT PAVEMENT FOR PARK-ING AREAS—(20-p. booklet) Describes off-street parking areas, with photos of typical installations. Technical engineering text tells how to construct these areas. Asphalt thicknesses required for different duty conditions are illustrated by typical cross-sections and supporting tables.—The Asphalt Institute, 801 Second Ave., New York 17, N. Y.



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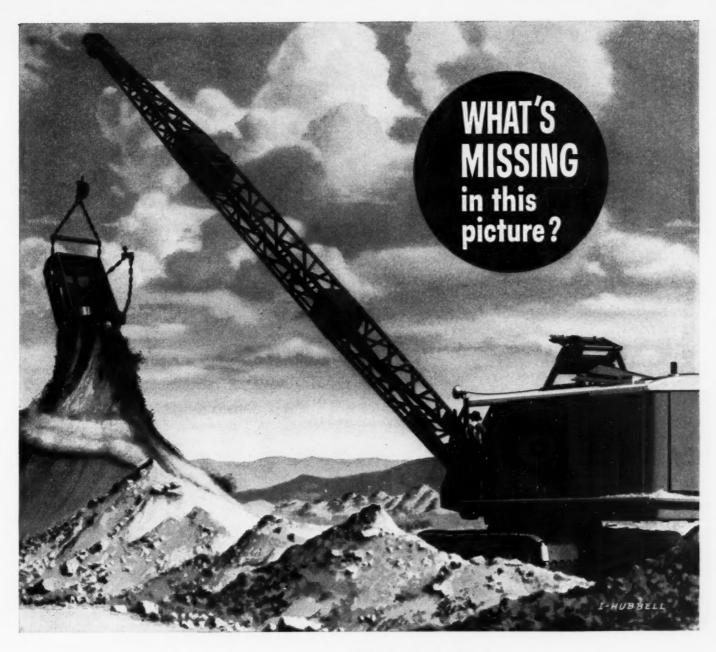
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MOLES' AWARDS

(Continued from page 87)

rections let's be sure that we do not endanger the very principles that we fought a war for: the rights of the individual in a free economy."

In accepting the non-member Award Mr. Morrison said: "Not infrequently we hear the familiar note of despair sounded by defeated or visionless men: 'There are no new frontiers. We are static. The end of an era has come. Our future lies behind us.' I am proud to say that this spirit of hopelessness is rarely found within the construction industry. We know that we shall always be hard pressed to reach the new frontiers which men of vision will always discover. The greatest understanding, good will and cooperation between management and labor, finance and commerce and between governments and peoples will be necessary to enable us to integrate construction's advances into our peacetime economy."

Crimmins Accepts Award

After receiving the member Award Col. Crimmins said: "Tonight I am glad to report progress in the negotiations of agreements between the contractors of New York City and the labor organizations representing the workers. Almost daily for the last month meetings have been held among the various groups of contractors and with the labor representatives. The approach of the contractors has been unselfish, many accepting conditions that will be burdensome for them in the interest of the industry as a whole.

"Labor, with but a few exceptions, has shown a desire and a willingness to go along. I sincerely hope that, when the new agreements are signed, there will be set up a council of labor and management that will be active in governing the heavy engineeringconstruction industry's problems.

"Also, it may be well for designers to give careful consideration to the labor conditions in any particular territory, so that alternate designs for structures may be available when there exists in any trade a shortage of men willing to perform a proper day's work under the same conditions as the rest of the trades employed."

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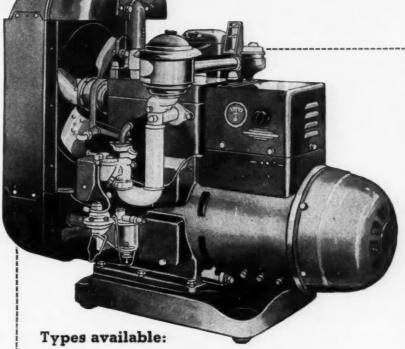
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See our display booth at the Western Metal Exposition and Congress Show at Oakland, California, March 22 to 27, 1947



ALTERNATING CURRENT: 60 cycles, single and three phase, 120-480 volts, 11/2 kva. and up, priced from \$250 up.

DIRECT CURRENT: 24, 110, 220 volts, 1/4 to 40 KW, priced from \$80 up.

All generators are sold under existing priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein.

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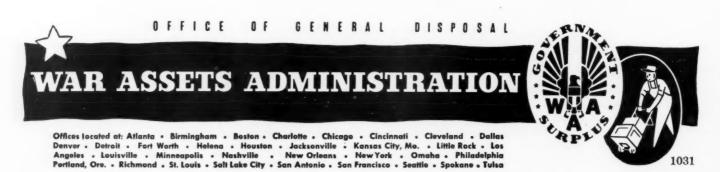
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Write to the Birmingham Regional Office requesting that your name be placed on their mailing lists when offerings are made of this type of equipment.





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AT AMAZING LOW PRICES

Millions of pounds of welding electrodes, welding rods and welding wire of carbon steel, stainless steel and non-ferrous metals. Through WAA you have a rare chance to get needed welders at minimum cost. All machines are of such well-known makes as Lincoln, Hobart, Westinghouse—all will give years of hard service.

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DC welding machines; electric motor driven generator; single operator type; 200, 300, 400 and 600 ampere capacity.

AC welding machines; single operator, transformer type; 300, 400 and 500 ampere capacity.

AC welding transformers for use in automatic arc welding process.

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March 1947 - CONSTRUCTION METHODS - Page 173



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wire or personal visit to any of the Regional Offices listed. If your offer is written, mark your envelope "Offer to purchase Trinitrotoluene A-56-2040".

* \$.07 per lb., f. o. b. location in crystals, flakes and 1-lb. blocks; \$.08 per lb., f. o. b. location in ½ lb. blocks; packaged in 50-lb. wooden or fibre boxes. Also available #10 & 12 blasting caps (required for TNT) and primacord.

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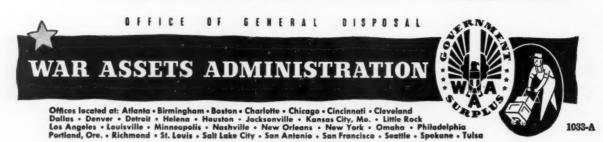
This material is offered, as is, subject to inspection by purchaser at location, without expressed or implied warranty except as to title. WAA reserves the right to reject any or all offers, to make awards in whole or in part, or to extend the period of sale. All items subject to prior withdrawal.

Purchasers of TNT are required to observe all applicable laws regulating the sale, use, handling and storage of explosive materials.

10% has been reserved to fill needs of Federal agencies received by April 30th. All other orders received by this date will be filled in following sequence: (a) Veterans of World War II; (b) All other priorities; and (c) Commercial pur-

chasers. Purchaser's order must state thereon:
(a) "This order is subject to WAA Standard
Conditions of Sale, and all other advertised
terms and conditions, and no other terms and
conditions shall be binding on War Assets Administration": and (b) Type of business and
level of trade.

WAA OFFICE	1/2 LB. BLOCKS	1 LB. BLOCKS	CRYSTALS	FLAKES
Birmingham		360,039	_	_
Chicago		1,225,931	_	_
Cincinnati	28,045	3,544,245	67,500	98,443
Dallas		787,020	-	
Denver		483,841		_
Fort Douglas	6,207	6,237,200	_	-
Los Angeles		966,350	_	-
Minneapolis		1,485,400	_	-
Nashville	1,751,100	_	***	-
New York		178,906	_	_
Omaha		1,848,550	14.250	-
Philadelphia		1,212,962	95,950	_
Portland	28.556	2.001.574	_	_
San Francisco		93,060		_
	6,392,663	20,425,078	177,700	98,443



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SEARCHLIGHT SECTION

(Classified Advertising)

"OPPORTUNITIES"

EMPLOYMENT BUSINESS
EQUIPMENT USED OR RESALE

RATES: Undisplayed—90¢ a line, minimum 4 lines.

Displayed-\$8.50 per inch per insertion.



Heater Sale 50% off

HERMAN NELSON powerful 250,000 BTU
Portable Heaters (gasoline-burning) complete
with blower, air-cooled engine, collapsible
ducts, portable mounting. No smoke; no soot;
no open fire. Self-powered, self-contained.
Cuts Winter's delays; improves efficiency.

HEATING buildings, shops, sheds, warehouses, buildings under construction, etc.

PRE-HEATING engines on trucks, tractors, dircraft, machinery, etc.

DRYING concrete, plaster, paint, mortar, lumber, other materials.

SPOT-HEATING men, materials, machinery, equipment, storage tanks, etc.

equipment, storage tanks, etc.

THAWING frozen areas, box cars, equipment,

VENTILATING and heating manholes, tunnels, box cars, ships holds, etc.

ORIGINAL COST with portable mounting over \$660.00

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WELL POINT SYSTEMS

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CAPACITY — 1½"

PRICE — \$27.50

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Dealers Territory Open

MONTGOMERY

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Waterproof with Formula No. 640

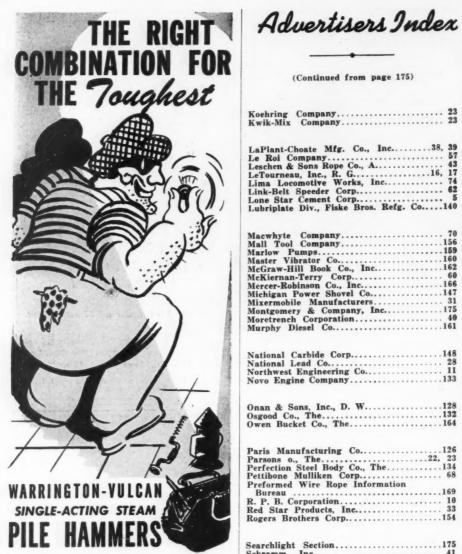
A slear liquid which penetrates 1" or more into soncrete, brick, stacco, etc., scals—bolds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts cests: Applies quickly—no miring—no eleanup—as furring—on membranes. Write for technical data—free samale.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

METAL-WINDOWS (STEEL-ALUMINUM-BRONZE)

LARGE STOCK—ALL TYPES

STEEL SASH SALES & SERVICE Weehawken New Jersey



Battering power, rugged strength, efficient and economical performance designed to sink the toughest pile—that's the right pile driving combi-nation embodied in the Single-Acting Warrington-Vulcan.

'It operates at medium steam pressure with rapid, regular, positive action. Simple design, with all parts exposed for easy! accessibility, gives it operational efficiency and economy. Massive power to drive any pile-wood, steel or concrete is delivered through moderate frequency of telling, low velocity blows from a relatively heavy ram. It's a combination proved in action since

Write today for full details on this rugged pile driver—the right combination for the toughest pile.



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Worthington-Ransome Blue Brute Distributors

See ad on 4th Cover for list of equipment in each line

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Orlando, Highway Equipment and Supply Co.
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Ga., Atlanta, Tractor & Machinery (Company
Ida., Boise, Olson Manufacturing Co.
Ill., Chicago, Chicago Construction Equip. Co.
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Ill., Chicago, J. A. Roche
Iowa, Cedar Rapids, McNall Mach. & Supply Corp
Ky., Harlan, Croushorn Equip. & Supply Co.
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Mish., Muskegon, Lakeshore Machy. & Supply Co.
Mion., Clayton, The Howard Corporation
Mo., Kansas City, Mach. & Supplies Co.
St. Louis, W. H. Reaves
Montana, Billings, Interstate Truck & Equip. Co
Helena, Caird Eng. Works
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N. J., No. Bergen, American Air Comp. Corp.
N. M., Albuquerque, Bud Fisher Co.
Roswell, Smith Machy. Co.
N. Y., Albany, Milton-Hale Machinery Co.
New York, Hodge & Hammond, Inc.
New York, Hodge & Hammond, Inc.
New York, Hodge & Hammond, Inc.
New York, Railroad Materials Corp.
Syracuse, Milton-Hale Mach. Co.
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Oregon, Portland, Andrews Machinery
Pa., Wilkes-Barre, Ensminger & Co.
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Philadelphia, Metalweld, Inc.
S. C., Columbia, Smith Equip. Co.
Nashville, Dempster Bros., Inc.
Memphis, Independent Tractor Co.
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Flint, Gransden-Hall & Co.
N. Y., Buffalo, Dow & Co., Inc.
New York, Air Compressor Rental and Sales
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Toledo, The Kilcorse Mach. Co.
Pa., Allentown, H. N. Crowder, Jr., Inc.
Pittsburgh, Atlas Equip. Corp.
Texas, El Paso, Equip. Supply Co.
Washington, Seattle, Star Machinery Co.
Wyoming, Cheyenne, Wilson Equip. & Supply Co.

BUY BUY BRUTES

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction Equipment Division Holyoke, Massachusetts

TRU-LAY Preformed for CROWD LINES

Heavy rocks and gravel make crowd lines quiver with strains. Yet it is in just such service that TRU-LAY Preformed proves its ability to take punishment.

The ideal wire rope for crowd lines is TRU-LAY

Preformed Improved Plow Steel. It gives better
and longer service. It represents the proper combination of strength and toughness for the most
grueling jobs. With this combination go long experienced engineering and thorough step-by-step
inspections. And TRU-LAY Preformed comes in all

constructions . . . all lays . . . all centers.

If you are buying wire rope for crowd lines or any other job get the help of an experienced American Cable engineer. Every salesman of American Cable wire rope has the exact specification (construction and grade) for every wire rope application. He can save you time and money. Wire for

him today.

LASTS LONGER

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SPOOLS BETTER ON DRUM

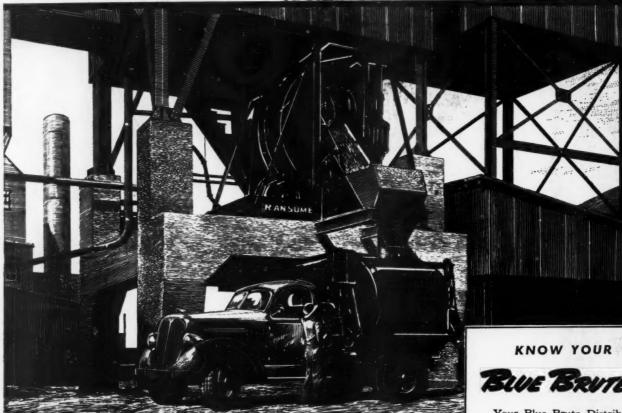


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GET A LOAD OF THIS LOW-COST MIXINC!



Speeding to your construction work, the new Ransome Blue Brute Horizontal Truck Mixer has a way of turning out the best in concrete at costs that mean money in the bank for you. Features like these are the secret of its always expert performance:

Exclusive drum design, stronger and lighter, with Ransome's famous mixing action . . . chilled car wheel metal rollers, each on two Timken roller bearings and running on extraheavy, heat-treated track . . . smooth, positive gear-and-pinion drive . . . improved transmission with single lever control, two speeds forward and reverse, separate engine clutch and multiple disc reversing clutches . . . trouble-free water system with enclosed pump-clutch, leak-proof poppet valves and unbreakable anti-freeze gauge glasses.

Built with capacities of 2, 3, 4½ cu. yds., this new Ransome Truck Mixer is easier to start, to control, to maintain -a sure bet for time-saving, economical concrete production in transit.

Up above, of course, that's another Blue Brute leader - a Ransome "Big" Mixer - top performer at so many central mixing plants and big-time construction jobs . . . and another reason why there's more worth in Worthington-Ransome.

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis. His name is listed on Page 176.

RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Acces-

WORTHINGTON



Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB